R E P O R T R E S U M E S

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INSTRUCTIONAL TELEVISION. A UTILIZATION GUIDE FOR TEACHERS AND ADMINISTRATORS.

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VIRGINIA STATE DEPT. OF EDUCATION, RICHMOND
EDRS PRICE MF-$0.50 HC-$2.72 66P.

DESCRIPTORS- *INSTRUCTIONAL TELEVISION, *TEACHING GUIDES, EVALUATION, *EQUIPMENT UTILIZATION, EQUIPMENT STANDARDS, *TEACHING TECHNIQUES, GLOSSARIES,

THIS ILLUSTRATED BOOKLET SKETCHES SUGGESTIONS FOR TEACHING METHODS, EVALUATION, AND EQUIPMENT ARRANGEMENT, AND GIVES A GLOSSARY AND BIBLIOGRAPHY FOR INSTRUCTIONAL TELEVISION. (LH)

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A UTILIZATION GUIDE FOR TEACHERS AND ADMINISTRATORS

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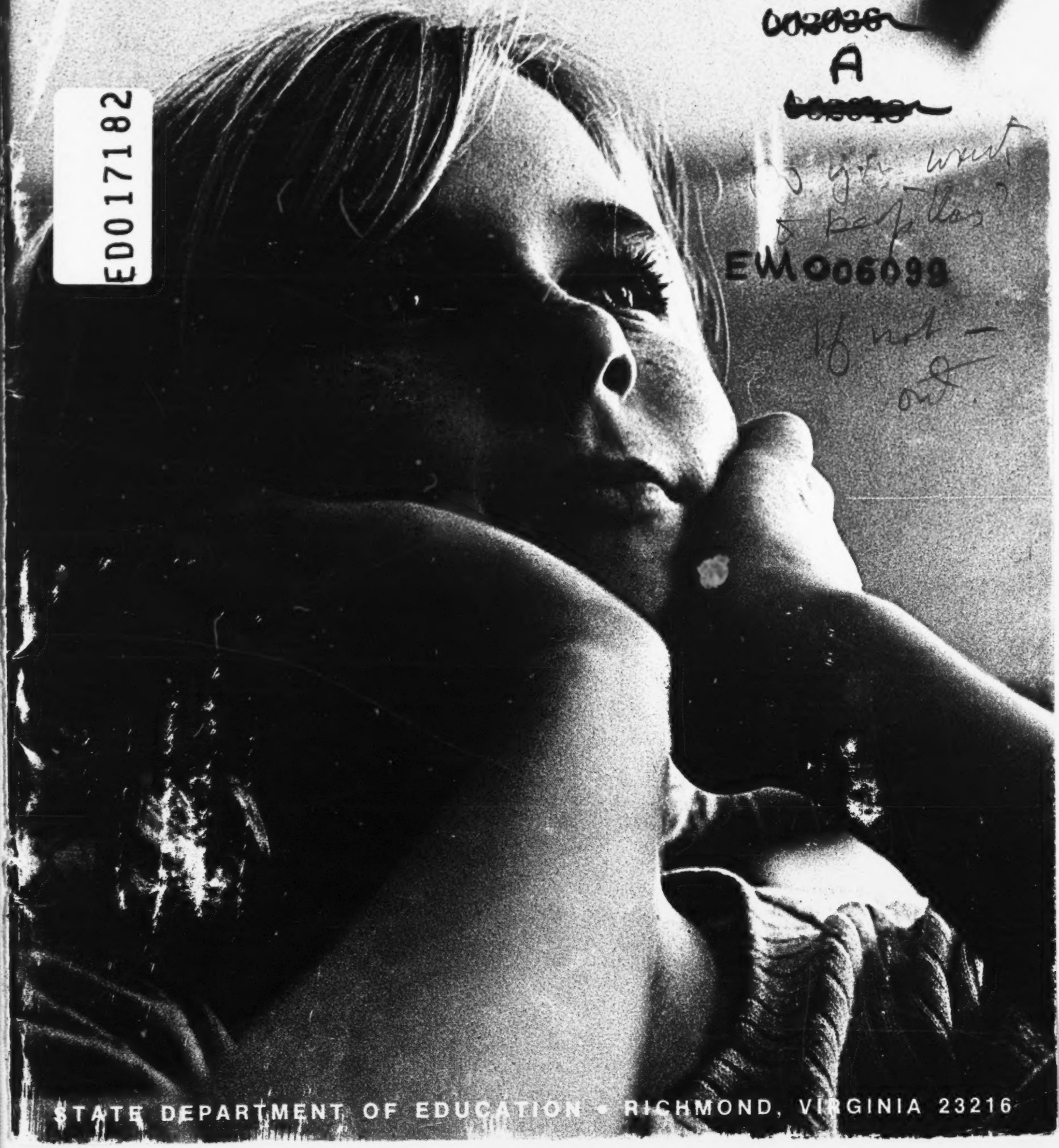

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INSTRUCTIONAL TELEVISION

A UTILIZATION GUIDE FOR TEACHERS AND ADMINISTRATORS

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EDUCATIONAL TELEVISION
VIRGINIA STATE DEPARTMENT OF EDUCATION

Photography and Illustrations
by Stuart Harris

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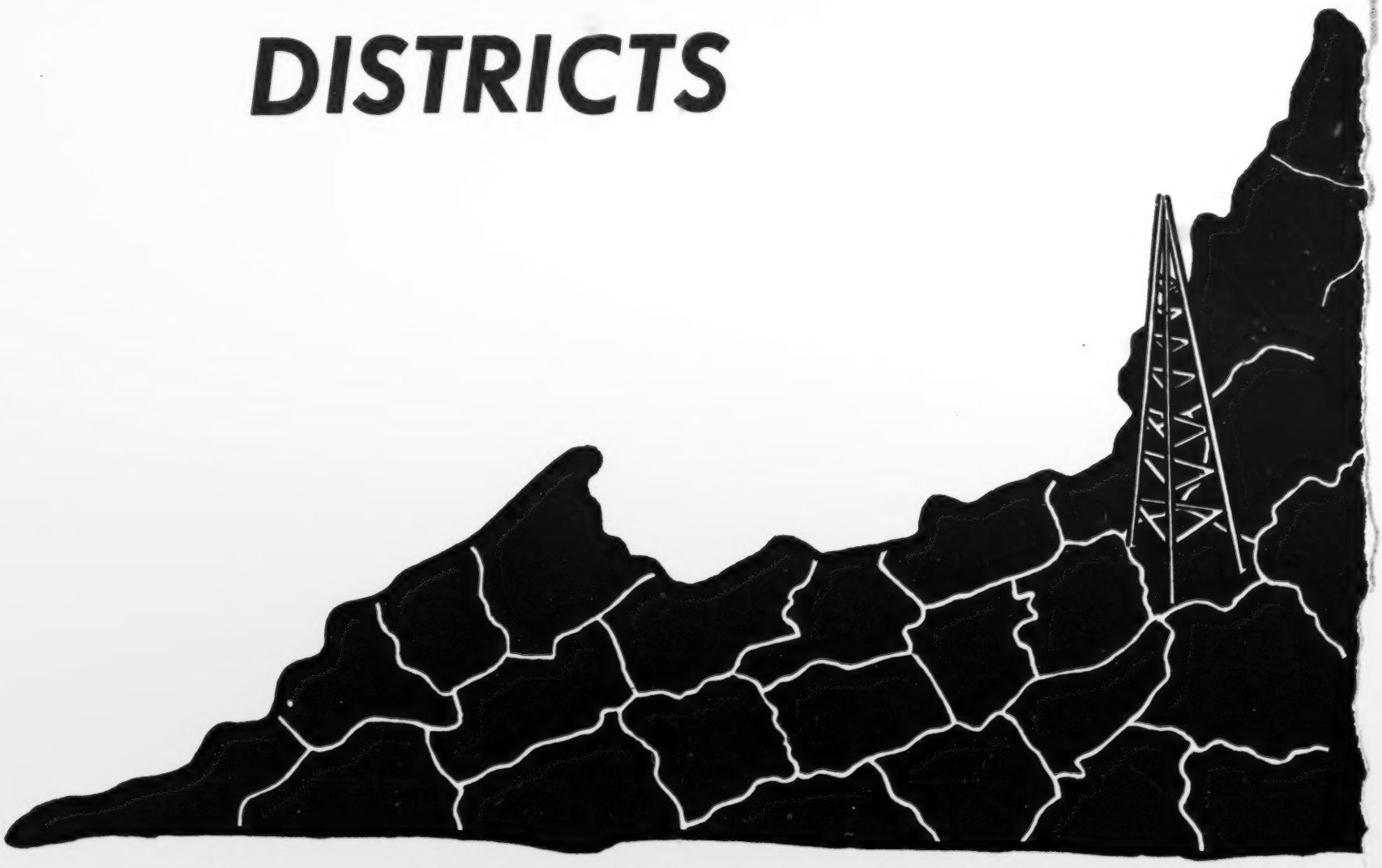
EDUCATIONAL TELEVISION DISTRICTS



WESTERN

NORTHERN

CENTRAL

EASTERN

INTRODUCTION

The value of television as a teaching tool has been successfully demonstrated. Its utilization at all levels of education over an extended period has established this medium as a significant and useful tool in the hands of the skilled teacher. The Virginia State Department of Education believes instructional television can make a definite contribution toward upgrading the quality of education in all public schools in Virginia.

A major key to the successful use of television in the classroom is the attitude of the teacher. Experience has indicated that a teacher may predetermine many outcomes of classroom activities simply by evidencing enthusiasm, knowledge, and a sensitivity to the job at hand. The reaction of the teacher to instructional television must be positive if the medium is to be effective.

Instructional television is a learning resource; it is neither designed nor intended to replace the classroom teacher, nor to serve as a substitute for activities involving vital teacher-student relationships.

For television to be effective as a teaching device there must exist a spirit of cooperation on the part of all school administrative and supervisory staff involved. Above all, the classroom teacher must understand its purpose and uses and be prepared to exploit its contributions to the teaching-learning process to the fullest advantage.

In preparing this guide the Department of Education has sought to utilize the talents and knowledge of the most experienced people in the field of instructional television. It is hoped that this material will be studied carefully and put to the greatest possible use.

Acknowledgments

The State Department of Education wishes to express its sincere appreciation to the following people for their valuable assistance in the development of this publication.

Mrs. Eloise Cowand, *ETV Supervisor*
for Norfolk city schools

Mrs. Mary Anne Franklin, *Vice President and Program Director*
for the Central Virginia ETV Corporation

A. Edward Ooghe, *Principal*
Summer Hill and Ruffin Road Schools, Richmond

Mrs. Eleanor Smith, *Assistant Manager of School TV Service,*
Channel 26, WETA-TV

Harry L. Smith, *Director of Public Information and Publications,*
Virginia State Department of Education

Mrs. Grace Waters, *Education Director*
for the Hampton Roads ETV Association

Dr. Harold Wigren, *ETV Consultant*
for the National Education Association

A special vote of thanks goes to the staffs of the Hampton Roads and the Central Virginia ETV Associations and to the many classroom teachers and students without whose assistance and cooperation this project would not have been possible. ■

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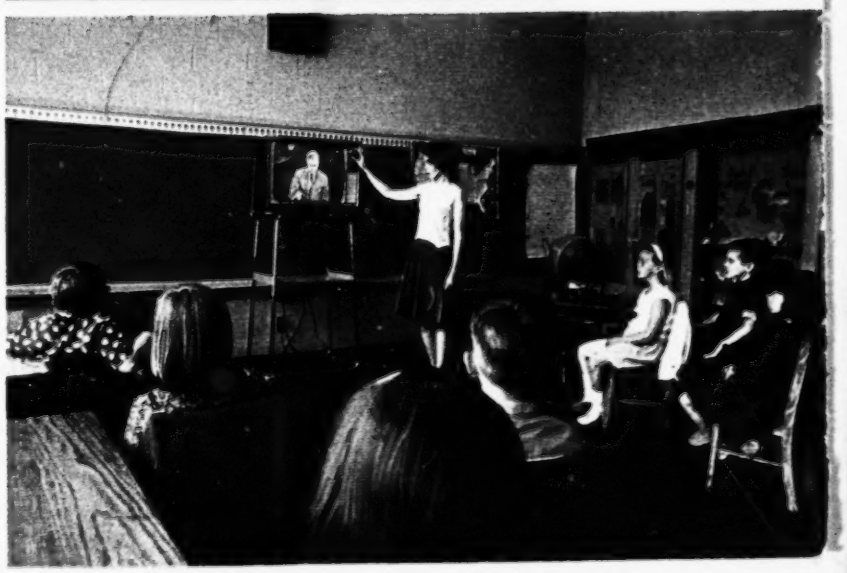
I.
Why Television?

The purpose of this guide is to assist classroom teachers in making more effective use of instructional television (ITV) programs. Most teachers will recognize that the techniques and methods mentioned are not new, for they are the same principles and procedures used in good teaching no matter what medium of instruction is involved.

Perhaps a good beginning would be to answer the very pertinent question raised by many educators, "Why Television?"

There is no magic in television. It is simply an electronic device, a one-way channel of communication which has many advantages and certain shortcomings. It can be used well or poorly. Properly used it can contribute a great deal to the improvement of instruction.



A. ADVANTAGES

Instructional Television:

1. Motivates learning. The visual impact of the TV presentation serves as a springboard for involving the learner in the subject.

2. Magnifies demonstrations and illustrative materials. The TV lens enlarges small objects to full screen size for intimate inspection.

3. Stimulates teachers, supervisors, and administrators to examine more closely the teaching-learning process.

4. Provides special instruction in all areas of the curriculum at all levels, depending upon the needs of the participating school divisions.

5. Accelerates the professional growth of teachers by making it possible for them to watch the teaching of others. Watching the studio teacher creates a greater awareness of teaching methods.

6. Makes it possible to upgrade the curriculum and to enrich the educational program more easily than ever before. This is accomplished by providing an effective way to introduce new courses and by bringing to the classroom special services such as talks by scientists, costly experiments, and special demonstrations.

7. Keeps all content material completely up to date.

8. Makes it possible for outstanding teachers to reach more students and gives receiving teachers more time for planning, study, and guidance.

9. Provides greater equality of opportunity for all pupils. In culturally deprived areas and in the most affluent districts children participate in the same lessons and special events. They have the same variety of courses and the same studio teacher. With television the small high school can offer courses which otherwise would be available only in the large high school.

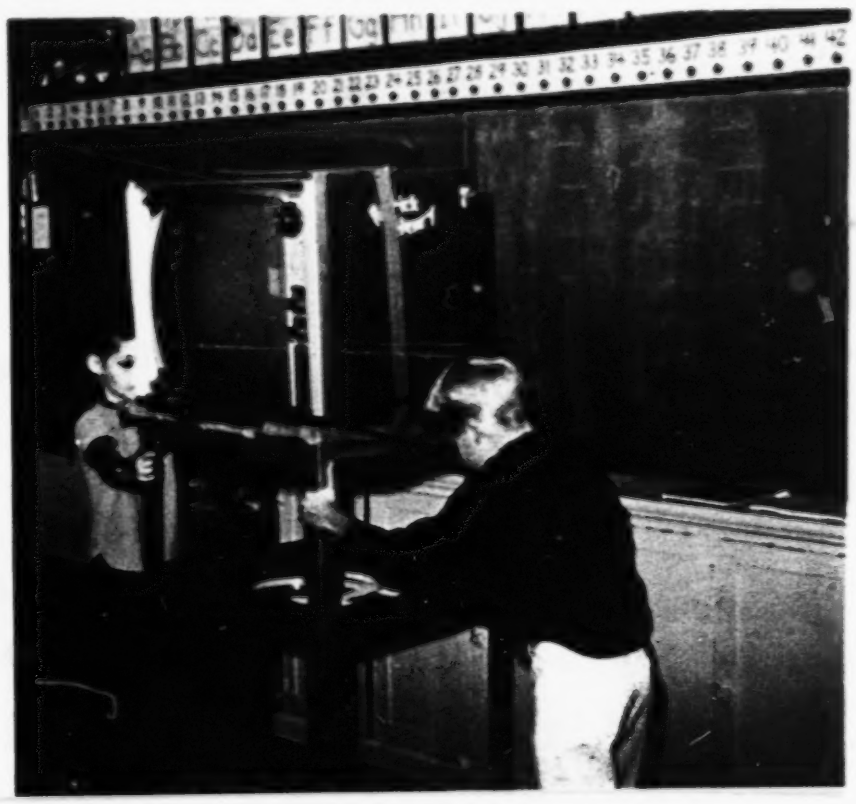
10. Helps the student assume more responsibility for learning by requiring him to watch and listen carefully, giving his full attention to the telelesson.

B. LIMITATIONS

To represent ITV as a panacea with no shortcomings would be unrealistic. In reality, like all media, it has several limiting factors.

Instructional Television:

1. Predetermines pacing of materials. It can neither be slowed for slow learners nor accelerated for fast learners. Its pace is constant.



Studio Control

Setting Up a Lesson

Three Minutes to Go

Audio Control

The visual presentation, however, conveys the concept to the slow learner and yet holds the attention of the fast learner. The classroom teacher in the follow-up period should compensate for variations in the pace within the class.

2. Provides little opportunity for verbal interaction between the studio teacher and the pupils.

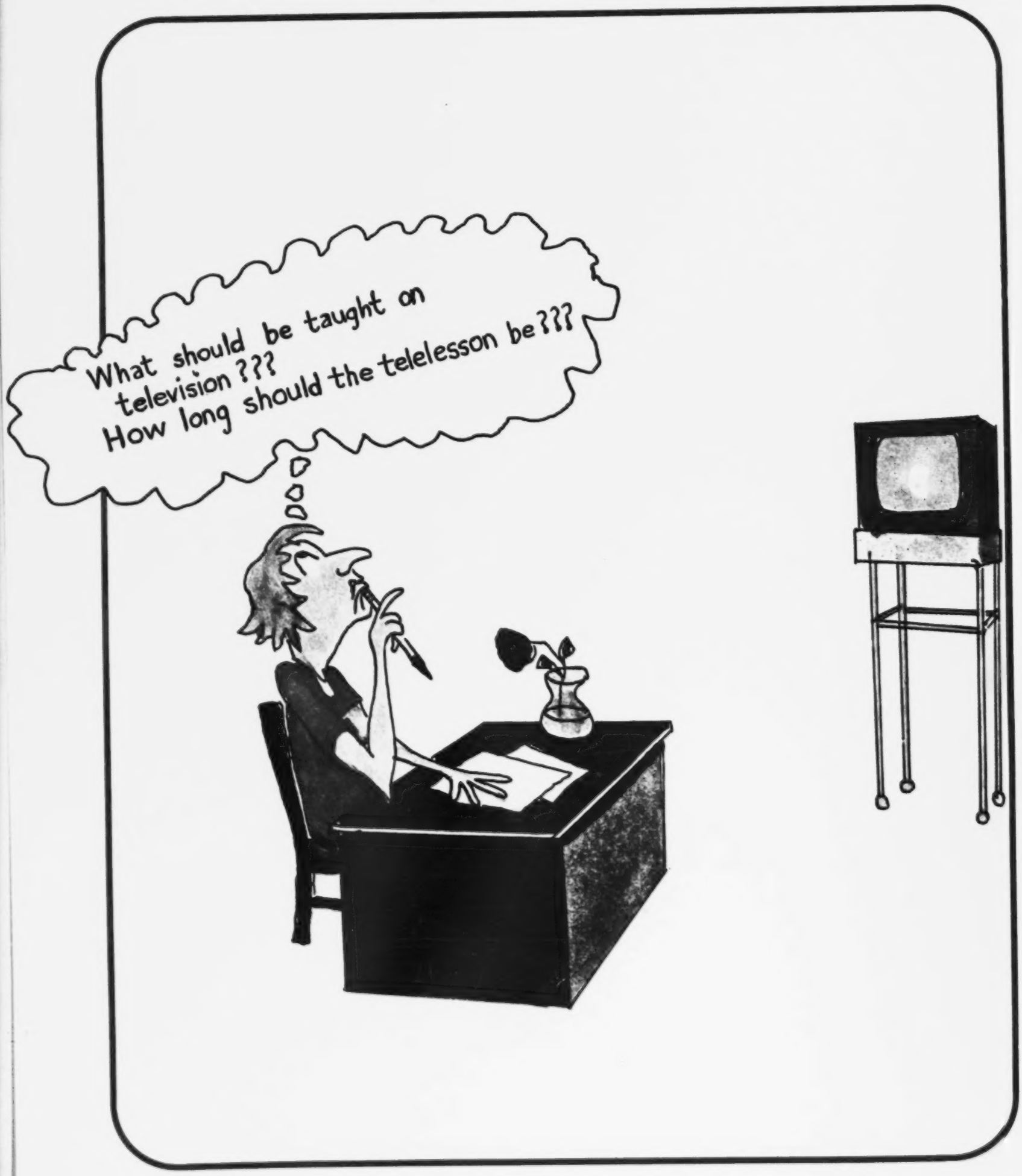
Rapport, however, is easily established and questions asked by the studio teacher are answered verbally or by a show of hands, particularly in the elementary grades. During the follow-up the classroom teacher has the opportunity to lead the class in discussion of unanswered questions. In addition, studio teachers make a practice of visiting classrooms in order to meet the classroom teacher and pupils personally. Pupils also are encouraged to write to the studio teacher.

3. Affords the studio teacher no way of seeing the reaction of pupils at the time the lesson is televised.

The studio teacher is, however, usually chosen on the basis of successful classroom teaching experience. He can anticipate questions which might arise at a given moment, can anticipate various types of reaction, and can plan and pace his lessons accordingly. In addition, teacher and student evaluation can keep the studio teacher constantly apprised of his success in meeting classroom needs.

4. Creates obstacles in scheduling.

Several means have already been devised to overcome this problem. Most television stations repeat many of their programs; several stations have acquired a second channel and more anticipate the inauguration of this dual system of operation; some stations are becoming linked with either a closed circuit or a 2500 megahertz system; a number of schools are purchasing portable video-tape recorders so that they may tape programs off the air and store them for use at more convenient times.


What should be taught on television ???
How long should the telelesson be???

C. SOME QUESTIONS

1. HOW MUCH TIME SHOULD BE DEVOTED TO INSTRUCTIONAL TELEVISION?

Television should not take up a major portion of a pupil's day. It is best used as a specialized kind of learning experience or as an aid to classroom instruction.

2. HOW LONG SHOULD THE TELELESSON BE?

This is determined by the age of the student (the attention span of a first grader is shorter than that of a high school pupil) and the subject matter taught. Generally speaking, lessons vary from 10 to 15 minutes on the primary level to 25 to 30 minutes on the secondary level.

3. WHY IS INSTRUCTIONAL TELEVISION MORE EASILY UTILIZED AT THE ELEMENTARY LEVEL?

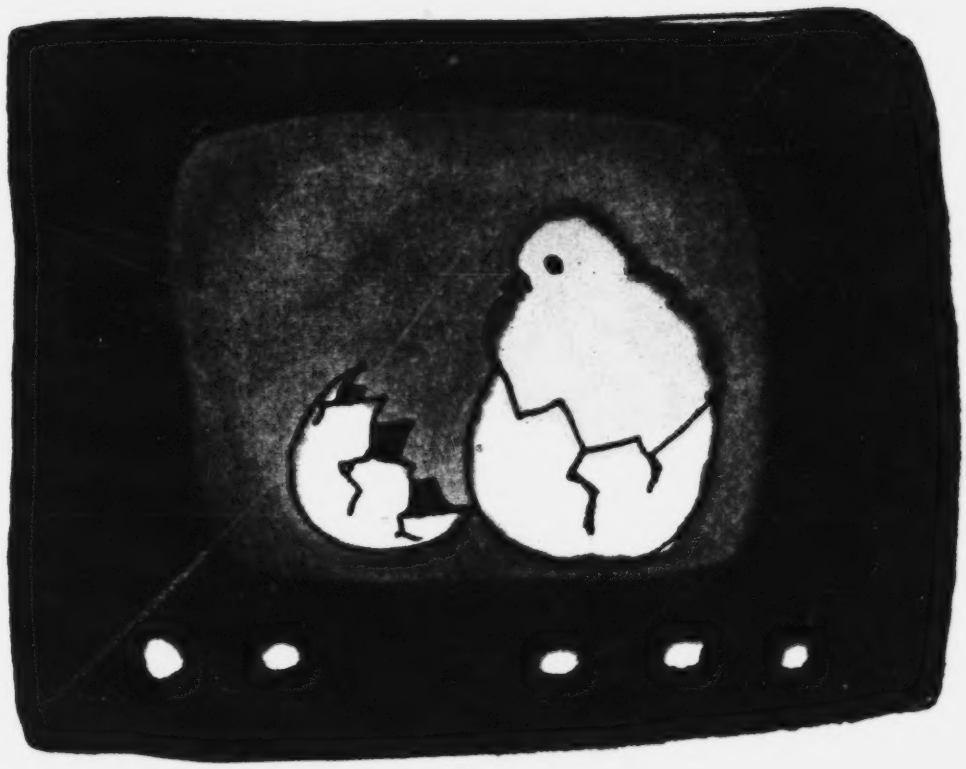
The flexibility of the elementary school day makes it much easier to use television than in the junior or senior high school where the schedule is often rigid.

4. WHAT IS THE RECOMMENDED CLASS SIZE FOR THE USE OF TELEVISION?

Ideally, the television set should be considered a standard part of the classroom and the television lesson should be treated as an integral part of the curriculum. Although it is sometimes necessary to have large groups of students view a television lesson in an auditorium or other large room, it is most desirable for students to view the lesson in their own classroom if possible.

5. HOW DOES INSTRUCTIONAL TELEVISION CONTRIBUTE TO CURRICULUM DEVELOPMENT?

One of the most valuable aspects of television is the unequaled opportunity it provides to examine and upgrade the curriculum and to enrich it by the addition of courses or lessons not otherwise available. All classroom teachers receiving a televised course have a common experience. This puts them in an excellent position to pool their experiences, ideas, and knowledge and to help the studio teachers improve these courses in the coming year.



6. WHAT SHOULD BE TAUGHT ON TELEVISION?

In general, television is best used in:

. . . Courses in which teachers welcome help;

. . . Subjects where the medium offers special visual and illustrative advantages;

. . . Courses which could not otherwise be offered.

7. IS INSTRUCTIONAL TELEVISION MORE SUCCESSFUL IN SOME SUBJECTS THAN IN OTHERS?

In all subjects experience has shown that television, used in conjunction with classroom instruction, produces results at least as good as those achieved when classroom instruction alone is used, and in many cases significantly better results are obtained. In some subject areas it may be a basic resource; in others its use is supplementary.

8. HOW EFFECTIVE IS INSTRUCTIONAL TELEVISION IN HOLDING THE ATTENTION OF STUDENTS?

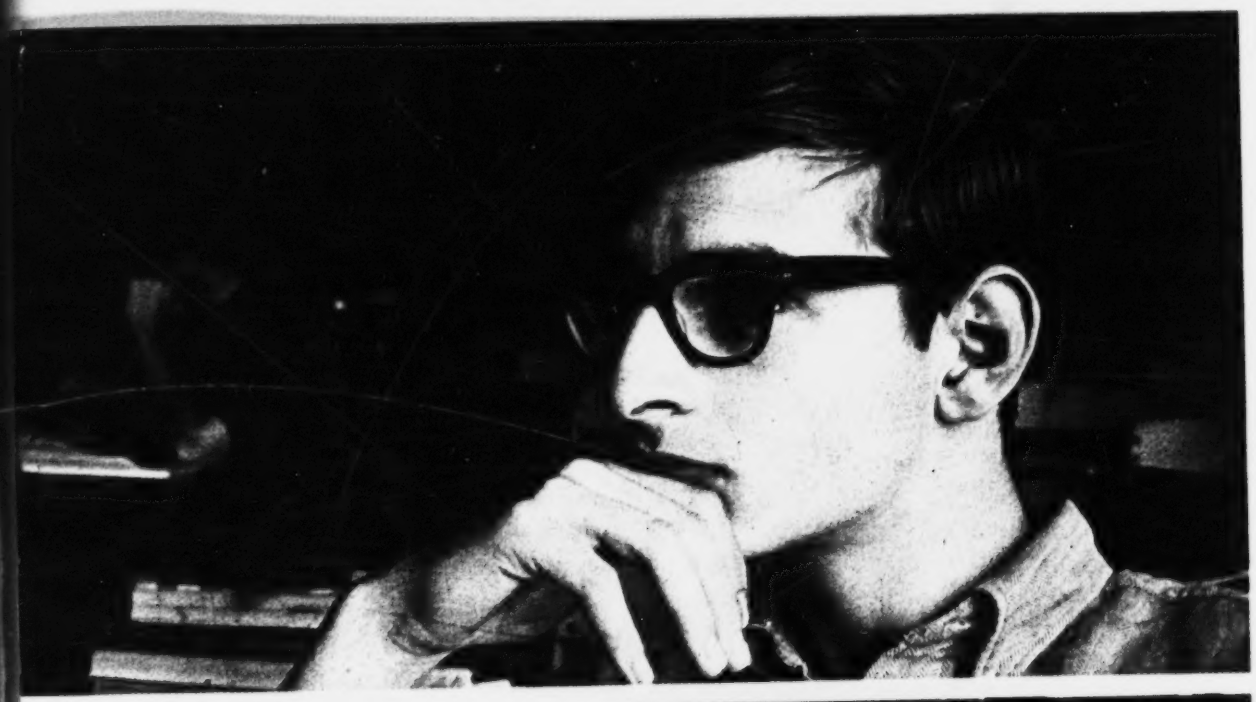
A well-planned, well-taught television lesson will command attention to a degree that is seldom achieved in the conventional classroom. The factors responsible for this are:

. . . The skill of the studio teacher;

. . . The great variety and change of pace that television makes possible;

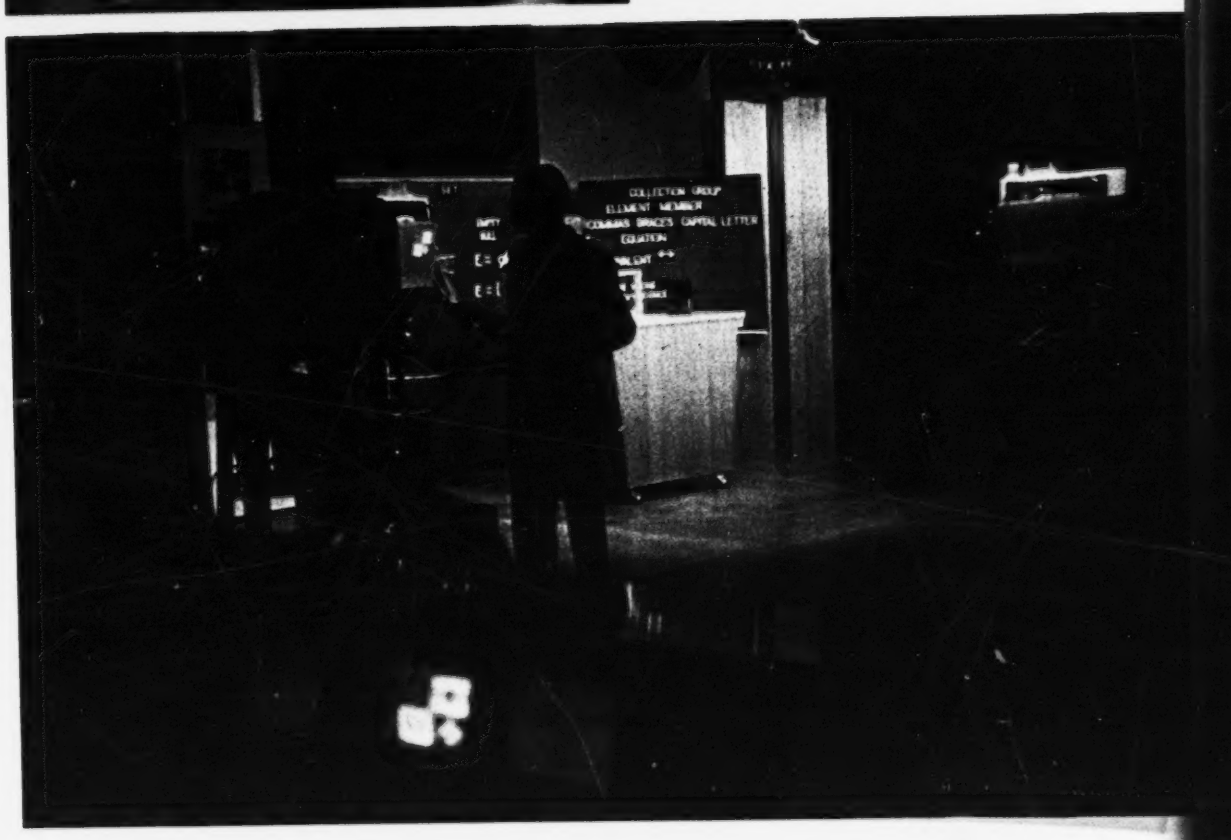
. . . The capacity of the screen for controlling, directing, and holding attention, showing only what is pertinent, and excluding the extraneous;

. . . Eye-to-eye contact between the studio teacher and students.



ITV in the Secondary School

Video-Tape Recorder



Quiet in the Studio—
Tape Is Rolling

9. HOW IS TELEVISION USED IN TEAM TEACHING?

The teacher in the studio and the teacher in the classroom combine their efforts to produce a lesson superior to that which either could produce alone.

The studio teacher concentrates on preparing his lesson and presenting it with maximum effectiveness using the many techniques television makes available.

The classroom teacher has a dual role. He prepares the pupils for the television lesson and, after it is over, guides them in related classroom work.

Both members of the team should recognize and understand each other's responsibilities and cooperate with each other.

The success or failure of the efforts of the studio teacher will depend largely on the support of the classroom teacher. The teacher who disapproves of television instruction or of the studio teacher quickly communicates his attitude to the pupils. Following the lead of the classroom teacher, pupils are quite likely to dismiss the television lesson and teacher as unimportant.

10. HOW DOES INSTRUCTIONAL TELEVISION ACCOMMODATE INDIVIDUAL DIFFERENCES?

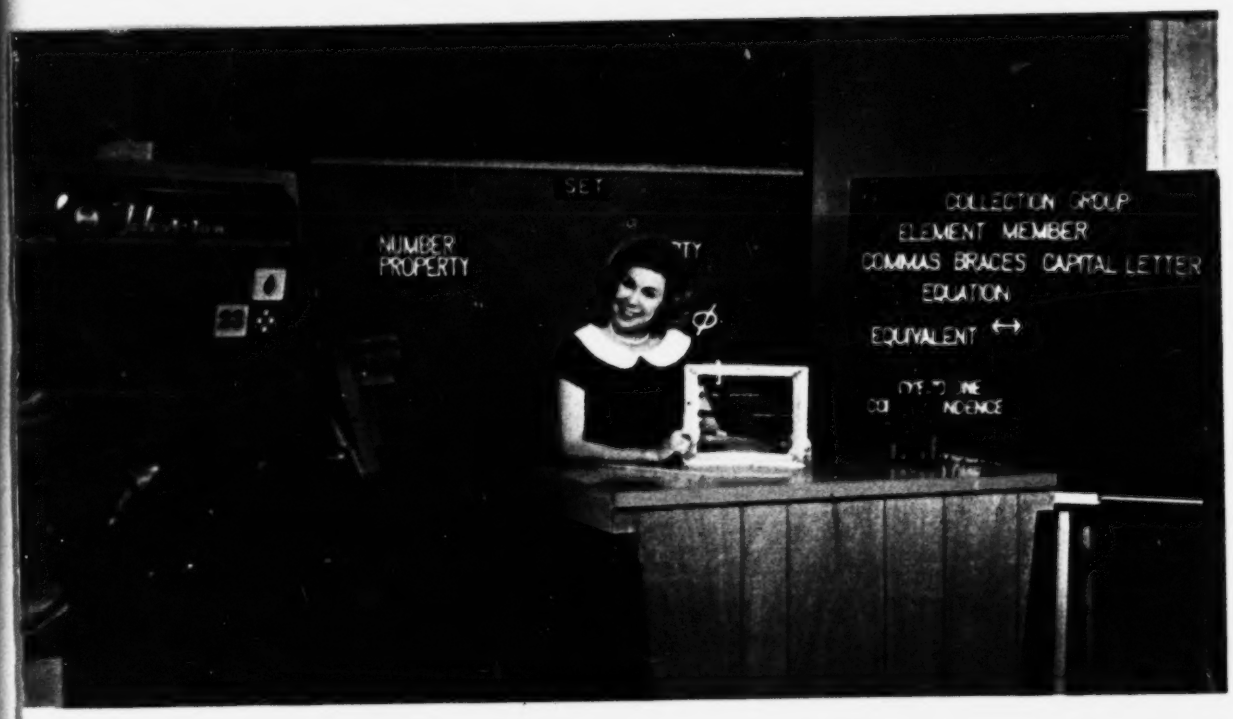
Most television lessons are designed for the average pupil; however, an effort is made in each lesson to inspire or challenge the above-average pupil. At the same time the visual nature of the lesson is of great benefit to the slow learner or pupil with reading difficulties. (In many cases, participating schools are urged to prepare more flexible schedules, bearing in mind that the grade designation is only a suggested one and that the programs should be used where they will be of maximum value.)

11. HOW IS A TELEVISION SERIES RELATED TO TEXTBOOK USE?

Many television lesson series are enrichment in nature and are totally independent of any specific textbook. Where a series is dependent upon a textbook, that book is on the State-adopted list of basal texts and the teacher's manual includes references to all of the other related books on the State list. ■

CONCLUSION:

Television is a tool designed to assist, not replace, *the classroom teacher. It should be looked upon as a conveyor of ideas, not a creator. Properly used it will make a significant contribution to the development of more meaningful learning experiences.*


SET
NUMBER
PROPERTY
COLLECTION GROUP
ELEMENT MEMBER
COMMAS BRACES CAPITAL LETTER
EQUATION
EQUIVALENT ↔

II. The Team

petal
stamen
stigma
anther
pistil
ovary

The Team

The classroom teacher who uses television for instructional purposes forms a partnership with the studio teacher and becomes an important member of a teaching team. Team teaching is not new; it has existed since the day two teachers recognized that each had specific interests and abilities in different areas. The use of television, however, has resulted in some radical changes in the traditional team approach.

The studio teacher makes his contribution to the learning situation via an electronic apparatus. The meaning and effect of his efforts are heavily dependent upon the attitude of the classroom teacher.

Television does not in any way diminish the importance of the classroom teacher; in many instances, however, it will change his role. When television is used for direct teaching, the classroom teacher becomes less a source of information and more a manager of the learning situation. He uses his professional skills to instruct pupils on an individual basis, to direct their learning, and to make full use of the resources and tools available.

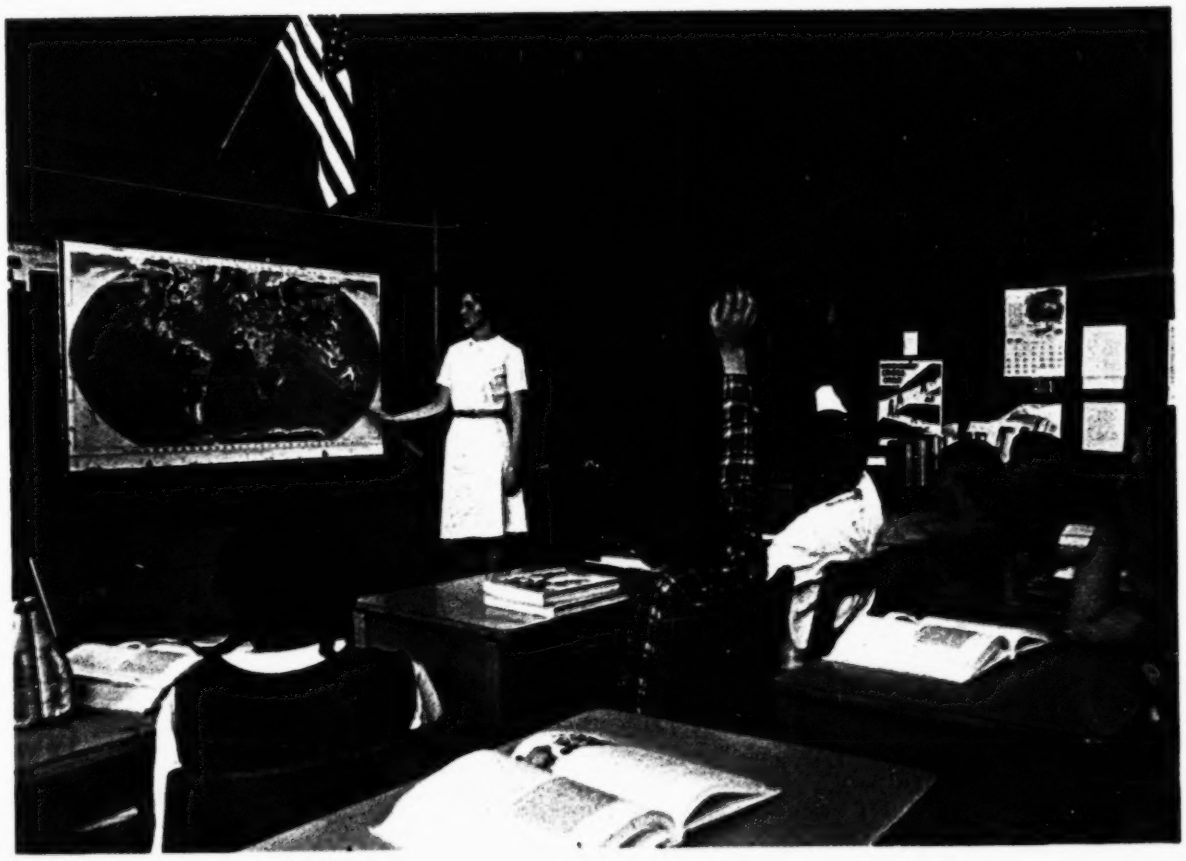
To ensure successful teaching with television each member of the team, as well as the students, should be fully aware of his responsibilities.

Team teaching with television provides an excellent opportunity for exchanging ideas, learning new approaches and techniques, and keeping abreast of world developments. Both teachers should always remember that they are working for the same goal—the development of more meaningful learning experiences.

A. THE CLASSROOM TEACHER

The techniques of good teaching are basically the same, with or without the use of television. There are, however, some differences for which teachers must provide.

The first step is to explain to students that instructional television is designed to teach, not to entertain. It should be made quite clear that the people who appear on the screen are professional teachers and, therefore, should be received with courtesy, respect, and attention.



The second step to effective teaching with television involves the establishment of ground rules. For example, the classroom teacher should:

. . . Stress the importance of good listening and viewing habits. The fact that television can neither be stopped nor slowed down demands that students listen attentively.

. . . Discuss testing procedures, homework assignments, and class participation. Let the students know what is expected of them.

. . . Establish conduct standards and see that they are met.

. . . Establish definite patterns for entering and leaving should it be necessary to move the students to and from a central viewing room.

The third step involves management of the learning situation. For example, the classroom teacher should:

. . . Utilize available resources such as fellow teachers, people in the community, museums, etc.

. . . Encourage and help students to work independently and to develop responsibility for their own learning.

. . . Check the physical environment of the room; make sure it is conducive to audio-visual instruction.

. . . Know the needs and abilities of individual students and be prepared to guide them in meaningful learning experiences.

. . . Study the curriculum guide well in advance of the telecast in order to understand the basic concepts and objectives to be presented. This will also make it possible for the receiving teacher to maintain the continuity of the television series in the event the scheduled program cannot be seen.

. . . Correlate the telecast with classroom instruction.

. . . Communicate often with the studio teacher; let him know the reactions of students to the telelesson.

. . . Promote discussion.

. . . Provide small and large group activities.

. . . Be alert to areas which need review and drill.

. . . Test and evaluate frequently.

. . . Establish consistent viewing habits.

. . . Develop new teaching techniques.

Instructional television programs will have far greater value if they are utilized and evaluated properly by the classroom teacher. The use of instructional television in no way diminishes the importance of the classroom teacher. It simply adds new dimensions to teaching.

B. THE STUDIO TEACHER

The studio teacher is a new type of educator. In consideration of the fact that he will be viewed by hundreds, sometimes thousands of students as well as many teachers, every effort should be made to employ the most competent person available. To qualify, an applicant should have successful classroom teaching experience, broad knowledge of his subject, adequate speech patterns, imagination, a pleasing personality which comes through on television, and the ability to stimulate and communicate with students.

These qualities, combined with adequate time, assistance, and resources, which are not ordinarily available to the classroom teacher, enable the studio teacher to produce lessons of a highly meaningful nature.

It is the responsibility of the studio teacher to make full use of television's unique characteristics in developing lessons which are well-organized, interesting, stimulating, and suitable to the age, abilities, and interests of the students. Every effort should be made to involve the learner as an active participant in the lesson.

It is the further responsibility of the studio teacher to:

. . . Present accurate information in an orderly and sequential manner.

. . . Visit classrooms when possible.

. . . Be receptive to ideas and criticisms presented by classroom teachers.

. . . Provide materials not ordinarily available in classrooms.

. . . Develop more effective ways of teaching.

. . . Make a continuing effort to evaluate all lessons for the purpose of updating and improving them.

C. THE STUDENT

The student is also a vital part of the instructional television team and has very definite responsibilities which must be met if television is to be an effective educational tool. These responsibilities are primarily concerned with the development of certain basic skills.

Since no part of the telelesson can be repeated, students must watch and listen carefully, devoting their full attention to the presentation. In the intermediate and upper grades, students should begin to learn how to take notes, to prepare outlines, and to summarize; however, excessive note-taking during the telecast can be distracting and might interfere with learning.

Since the telecast should not be interrupted, students must learn to save their questions and comments for the follow-up discussion.

The studio teacher must assume that students will be prepared for the telelesson; therefore, it is essential that all participants develop consistent, disciplined habits of study in making daily preparations. With television, as with all effective teaching-learning situations, students must be alert; they must question, challenge, and learn to think and work independently as well as in groups. ■

III.

The Lesson

The successful use of television for instructional purposes necessitates dividing the class period into three parts: pre-telecast, telecast, and follow-up. It is important that the teacher consider these three divisions as a whole.

A. PRE-TELECAST

This period should be used by the classroom teacher to:

. . . Create a climate for learning by displaying *interest* and enthusiasm in the lesson.

. . . Establish the purpose of the lesson and make sure it is understood.

. . . Arouse student interest by raising questions and by having students raise questions about the material to be presented, by discussing aspects of the lesson which will capture their imagination, by making an attractive display on the bulletin board, etc. *The teacher should not pre-teach the TV lesson.*

. . . Distribute materials and make sure pupils have them organized and ready to use. This will help eliminate distractions and reduce confusion during the broadcast.

. . . Write special vocabulary, specific questions, problems, and outlines pertaining to the telecast on the chalkboard, and explain.

. . . Turn on set(s) in ample time and make certain it is operational and in the best position for viewing, i. e., free of glare and reflection. If having the set turned on before the telecast begins distracts members of the class, the picture can be lightened until it is hardly visible by turning contrast control button. Also keep

the volume down. (In large groups, where several sets are used, these duties may be assigned to students.)

... Provide adequate lighting for taking notes. Television should never be viewed in a darkened room.

... Prepare the class in advance for the telecast.

B. TELECAST

During the telecast the classroom teacher should:

... Take an active and enthusiastic interest in the program, participate when participation is called for, and react when a reaction is required. The students will follow this example.

... Be located so as to observe the telecast and the reactions of the students. Individual student reaction may be a basis for follow-up of the television lesson. The teacher should watch for clues that may indicate questioning, difficulty, boredom, and high or low motivation.

... Adjust sets when necessary for sound and picture. Too much volume causes a vibration which distorts sound.

... Set a good example for the class by being attentive and alert. The teacher should not use the television period to correct papers, work on attendance records, mark report cards, etc.

... Be prepared to cope with possible distractions such as broken pencils, lack of materials, and outside interruptions. A "Do Not Disturb" sign might be placed outside the classroom door.

... Take notes to guide the discussion for further emphasis and clarification during the follow-up. Note-taking on the secondary level sets a good example for the students and provides a valuable reference for test construction.

... If convenient, move among students periodically to observe progress. Care must be taken to avoid blocking the view or distracting attention. Such activities as writing on the chalkboard, using the overhead projector, answering questions, or making comments during the telecast should be avoided.

... Deal with behavior problems without delay.

... Turn the set off immediately when the television lesson ends and begin the follow-up. Delay will often result in disturbances.

C. FOLLOW-UP

The television lesson is never intended to be a complete learning experience in itself. It can be meaningful only when it is followed by the types of learning activities which make the television lesson an integral part of the total learning process.

At the conclusion of the telecast, the classroom teacher should make a quick appraisal to determine just how successful the studio teacher has been in teaching the lesson's purpose and in meeting the needs of the students. The teacher must then decide which areas need reinforcing, clarifying, or expanding. A few penetrating questions directed to the students will provide the answer.

An immediate follow-up lecture is a poor teaching technique.

The classroom teacher should not use the follow-up to reteach the television lesson.

This portion of the class period should be devoted to activities which will:

- . . . Help students to understand the concepts presented and to form their own generalizations and conclusions.
- . . . Clarify misunderstandings.
- . . . Develop critical thinking.
- . . . Extend the lesson through discussion and enrichment.
- . . . Encourage students to seek answers to questions raised through research and independent study.

When choosing follow-up activities the teacher should:

- . . . Refer to the Teacher's Guide for possible suggestions on how to extend learning beyond the television lesson.
- . . . Evaluate frequently. Quizzes are excellent for determining where instruction needs to be reinforced, but the teacher should not make the common error of using the follow-up only for testing the pupils to determine what facts they have acquired. This is an excellent opportunity to discover whether attitudinal changes have occurred.
- . . . Consider the possible use of other audio-visual devices which might be helpful in reinforcing learning activities.
- . . . Provide for individual differences.

Having determined the needs, the teacher must then choose the technique which best accomplishes the desired results. Some possible activities: . . .

DISCUSSIONS . . .

- Questions and answers
- Small group discussions; "buzz sessions"; "buddy system" (where two persons work together to make a list, fill in the blanks, plan for a report, etc.)
- Panel discussions; quiz panels
- Debates
- Symposiums
- Clubs and special interest groups
- Oral reports

DRAMATIZATIONS AND ORAL PRESENTATIONS . . .

- Role playing
- Skits; plays
- Choral reading
- Pantomiming; shadow plays; charades
- Puppets
- Games

PROJECTS AND DEMONSTRATIONS . . .

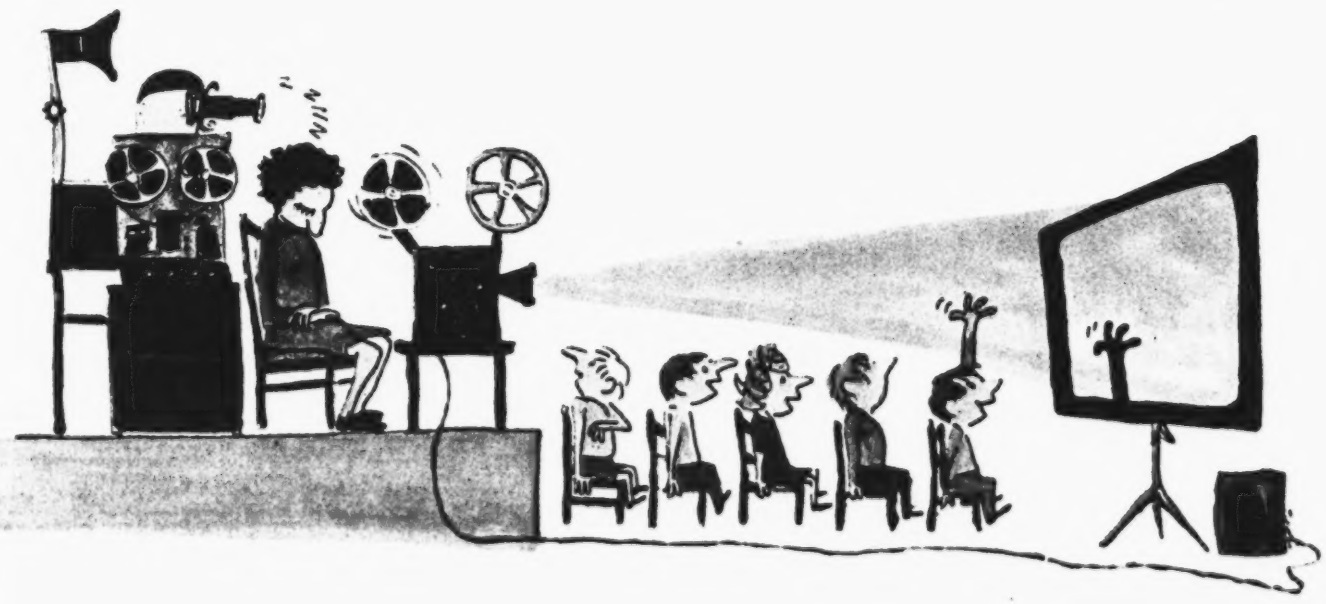
- Experiments; continuing experiments; demonstrations
- Problem-solving activities
- Fairs and exhibits of projects
- Models; maps; murals
- Aquariums; terrariums; pets; insect colonies; plants; cultures

AESTHETIC AND CREATIVE PROJECTS AND DEMONSTRATIONS . . .

- Dioramas
- Mock-ups
- Collages
- Drawings; paintings
- Models
- Story-writing; poetry
- Bulletin boards
- Block printing
- Sculpturing
- Mobiles
- Instrumental presentations
- Mosaics
- Music appreciation
- Folk dancing
- Choirs
- Assembly programs

OTHER EDUCATIONAL MEDIA . . .

- Film projector
- Filmstrip projector
- Film loops (8 MM)
- Slide projector
- Educational games
- Programmed learning
- Overhead projector
- Opaque projector
- Independent learning devices
- Tape recorder (audio)
- Portable television tape recorders
- Record player
- Maps; charts; models; globes
- Education boards—bulletin; flannel; magnetic; etc.

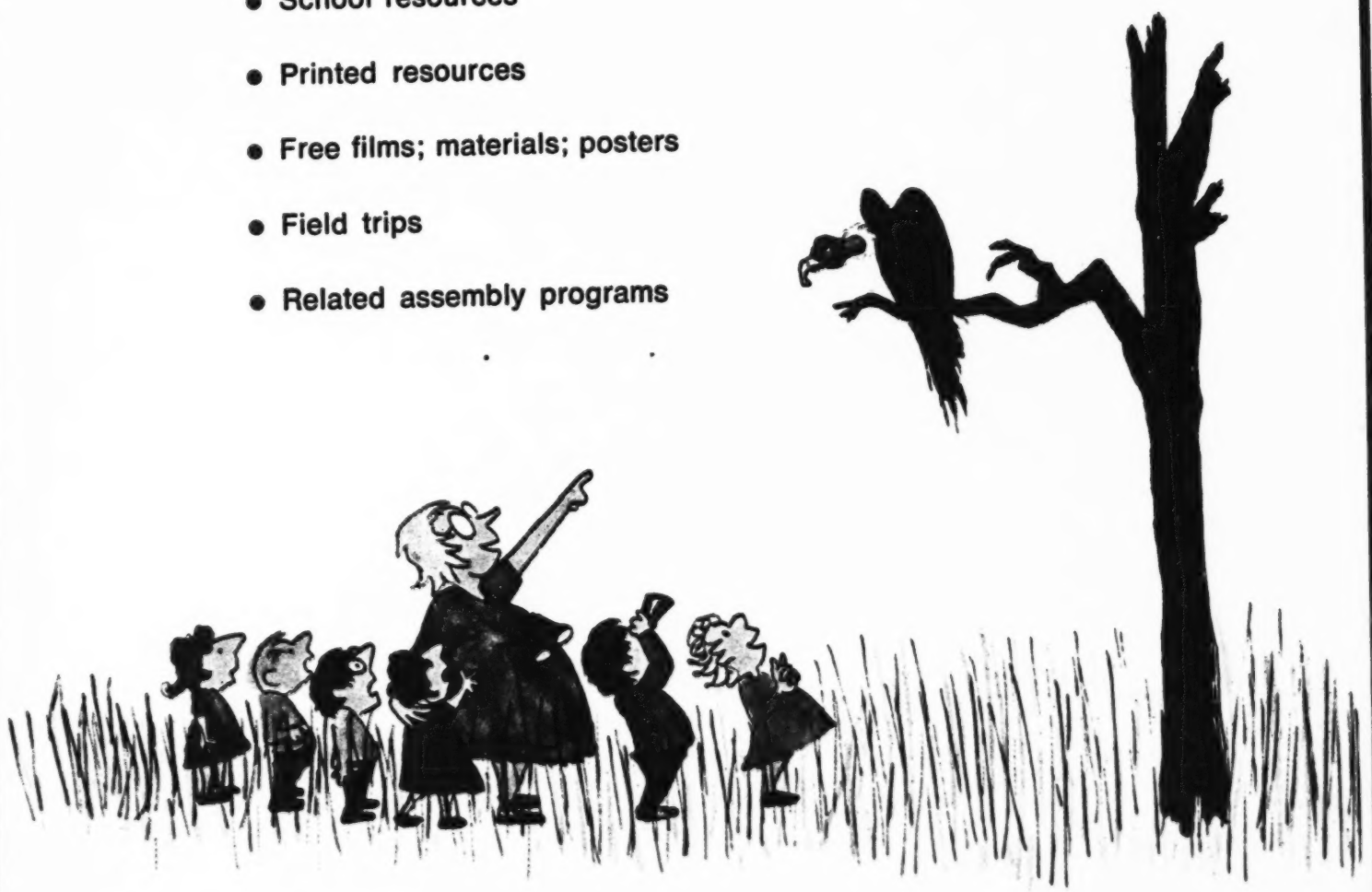


RELATED READING . . .

- Independent research
- Meaningful assignments
- Reports
- Reference books; textbooks; library books; magazines; encyclopedias; newspapers

ADDITIONAL RESOURCES . . .

- School personnel
- Pupils
- Community people
- Industry
- School resources
- Printed resources
- Free films; materials; posters
- Field trips
- Related assembly programs



IV. Evaluation

Classroom teachers using instructional television programs have the ultimate responsibility for helping the learner to make maximum use of the telecasts. In meeting this responsibility the teacher must make a continuing effort to evaluate the effectiveness of the television lessons.

A. THE CLASSROOM TEACHER— SELF-EVALUATION

Many teachers have found that they can be much more objective in their evaluation of the telecast if they first make a self-evaluation, considering such questions as the following.

1. DID I CREATE A PHYSICAL CLIMATE FAVORABLE TO TELEVISION BY PROVIDING:

   . . . Adequate lighting?
   . . . Suitable ventilation?
   . . . Comfortable room temperature?
   . . . Furniture arrangements designed to give maximum advantage in viewing and listening?

2. WAS THE TELEVISION RECEIVER:

   . . . Turned on and adjusted prior to the telecast?
   . . . Placed in the most advantageous viewing position?
   . . . Free of glare?

3. DID I USE THE PRE-TELECAST PERIOD TO:

   . . . Discuss the objectives of the lesson with my students?
   . . . Present vocabulary and review the material necessary to understand the telecast?
   . . . Develop student interest in the lesson?
   . . . Give the students specific points for which to look and listen?

4. DURING THE TELECAST, DID I:

   . . . Set a good example by taking an active interest in the lesson?
   . . . Observe students, keeping alert to reactions indicating a need for reemphasizing points made by the studio teacher?
   . . . Lead responses when called for by the studio teacher?

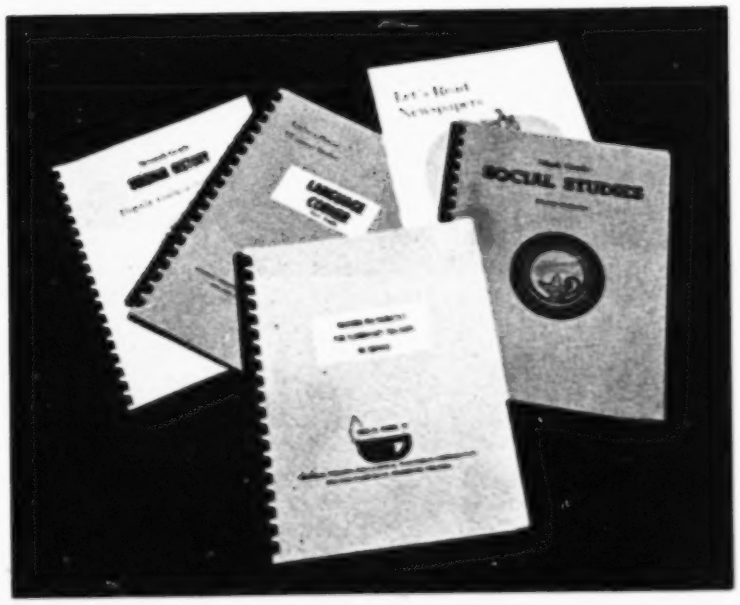
5. DURING THE FOLLOW-UP, DID I:

   . . . Establish continuity with the studio teacher's efforts by beginning my presentation as soon after the telecast as possible?
   . . . Give students an opportunity to discuss points of interest and ask questions?
   . . . Give individual help and create learning experiences suitable to the viewing abilities of my students?
   . . . Encourage independent activities related to the telelesson?
   . . . Make assignments involving different kinds of study skills?
   . . . Function as a member of the teaching team?

B. THE TELEVISION LESSON

The next step in the evaluation procedure is the television lesson. To make an intelligent evaluation the teacher must understand the efforts that go into the development and production of each telecast. Let us consider, then, the steps, personnel, and facilities involved in ITV production.

The production of the television lesson is the responsibility of the studio teacher who is assisted by a number of professional and technical people and who utilizes a great variety of resources.

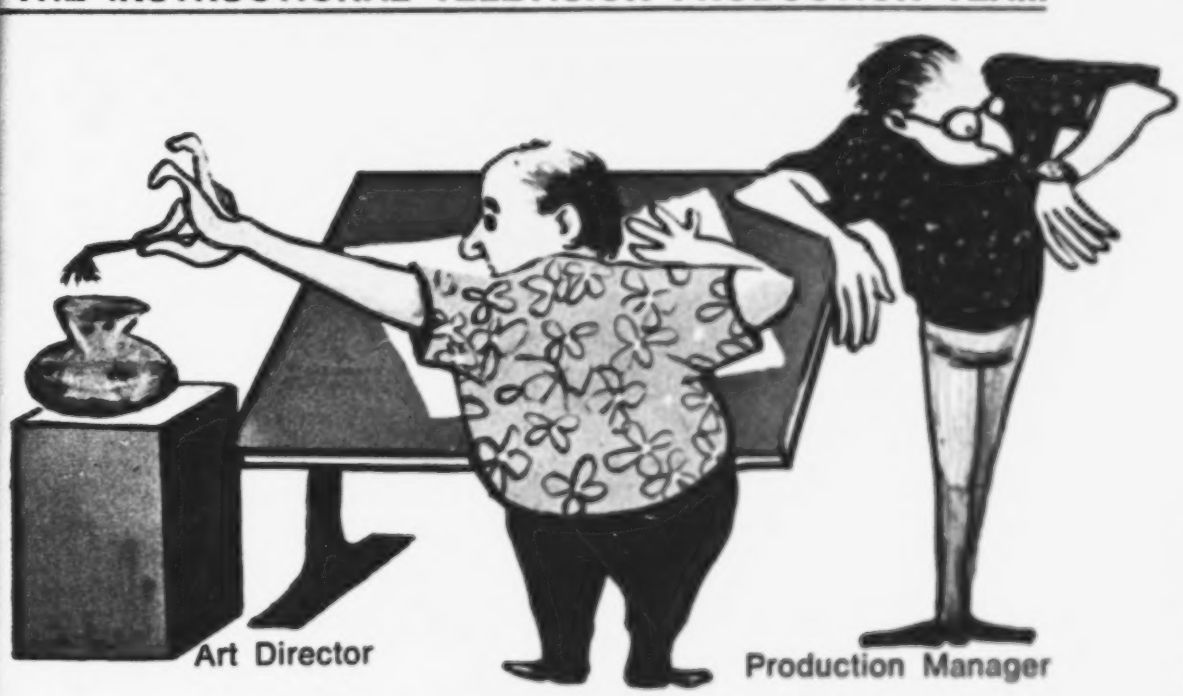


The first step in this rather involved procedure concerns the *curriculum guide*. Each course taught on television is organized, developed, and outlined by an instructional committee composed of local educators and national authorities who specialize in a particular subject area.

The curriculum guide contains valuable information such as: the number and title of lessons to be taught; objectives of the lesson; major concepts; new vocabulary; and suggested activities. This guide makes it possible for the receiving teacher to know well in advance what material will be covered in the TV lesson. The studio teacher uses the guide primarily for organizational purposes. He has a responsibility to the classroom teachers to follow it as closely as possible. Receiving teachers should be notified well in advance of the broadcast of any variation between the telelesson and the curriculum guide.

Having determined from the guide the subject matter he is to cover, the studio teacher next must

THE INSTRUCTIONAL TELEVISION PRODUCTION TEAM



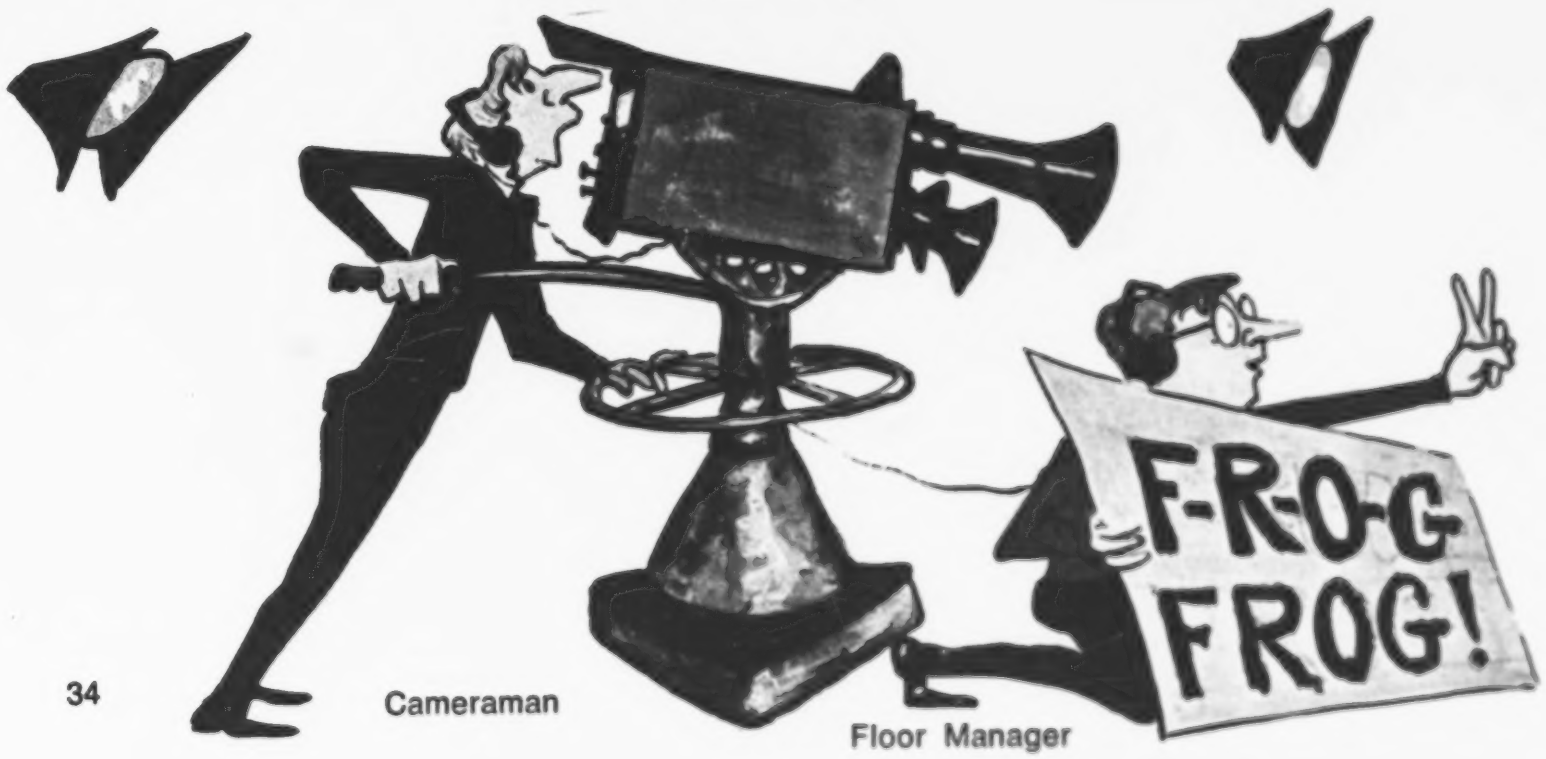
Art Director

Production Manager

Photographer

Director

Audio Engineer



Cameraman

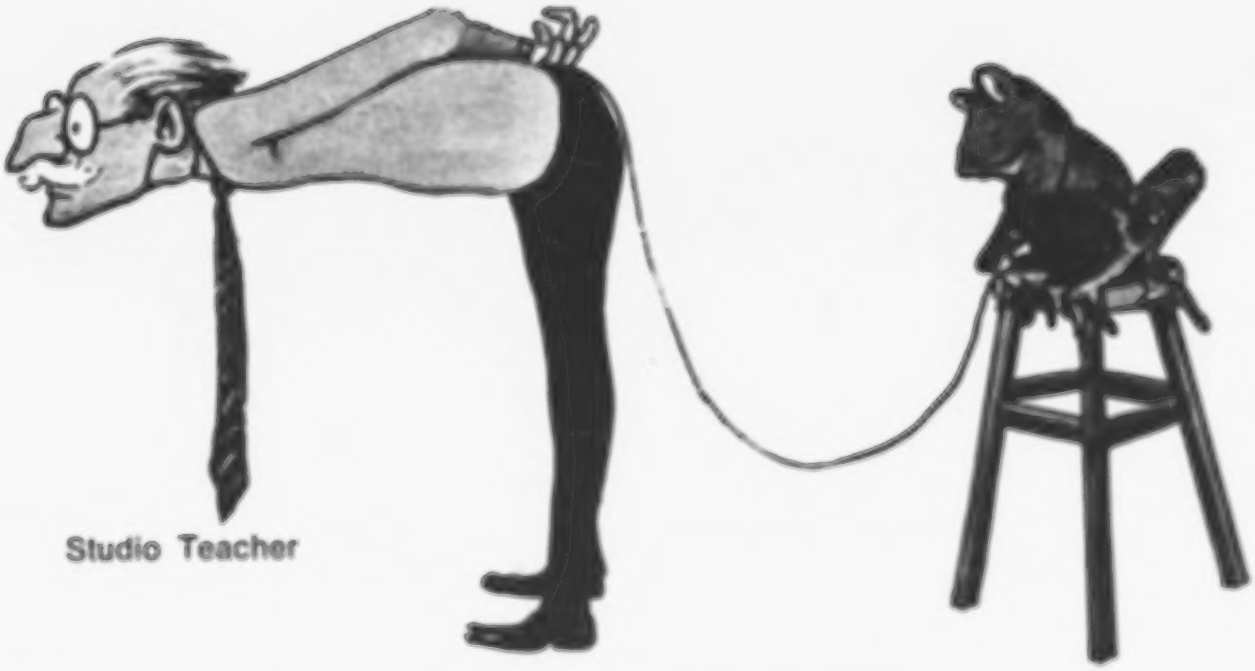
Floor Manager

Librarian

Scenic Designer

Video Engineer

VTR Engineer



Studio Teacher

begin to organize his research. Knowing that his work will be carefully scrutinized by a great many teachers and students, he must be especially careful to be certain his information is meaningful and accurate.

In this area of research and development, the studio teacher has a distinct advantage over the classroom teacher because he is given ample time and resources to develop meaningful lessons. Needless to say, any teacher could do a better job given similar advantages.

Once the studio teacher has completed researching his lesson, he must then consider how best to illustrate his material. Special consideration must be given to the visual aspect of the lesson, for it is in this respect that television makes its unique contribution to the teaching-learning process. This is

also the area in which the studio teacher has the greatest assistance and the widest variety of resources available to him.

The studio library, which contains pictures, slides, and models as well as many film clips, is his first source of reference. If the particular visual he needs is not in the library, he goes to the staff artist, describes the scene, event, or individual he wants to illustrate and has it produced.

If his lesson material calls for photographs or motion pictures shot on location, he can submit a work order to the professional photographer and a date will be set for shooting the desired scenes.

Perhaps a particular lesson calls for a special set; in that case the teacher will have a conference with the studio set designer who in turn will create the scenery or effects desired.

All of these resources will be utilized in some lessons; however, in most instances the studio library, supplemented by the talent and skill of one of the creative professional staff, will be sufficient.

With the research and visualization of the lesson complete, the studio teacher must combine the two in an organized script. Good scriptwriting requires a special skill that most studio teachers acquire only after much practice. The script must be developed in such a way as to inform all of the people involved in the production, i. e., the technical director, the floor manager, the audio-control en-

gineer, and the cameramen, of the sequence of the camera shots to be made. The script also must be very carefully timed because in television every second counts.

When the script is completed the teacher should review it carefully with the director to make sure that there is understanding and agreement about what is to be done. The director also will want to check the technical feasibility of the script. The teacher may have called for camera shots which are not possible to take.

Following the teacher-director script conference the production manager must be consulted to determine the most convenient time for taping the lesson. Of course all teachers have schedules for studio use, but quite often problems will arise to disrupt the schedule.

The actual taping of the lesson is quite involved and requires the talents of many persons. First, the teacher and director must "set up" the lesson in the studio. Visuals, such as pictures, maps, and graphs, must be placed in their proper sequence and positioned for rapid camera shots.

Film, if used, must be put on the projector and properly cued. The director or lighting specialists must light the set using spotlights, floodlights, and whatever is necessary to eliminate shadows and create the proper light intensity.

With the "set up" of the lesson completed and the lights properly adjusted, the teacher, cameramen, floor manager, and director will go over each shot to make sure everyone understands the audio and video sequence. This procedure is known as a "dry run."

When the director is satisfied that everyone understands exactly what he is to do, he will give the order "quiet in the studio." The cue is then given to "roll tape," and another lesson begins.

The actual time required for a studio teacher to reach this point in his production varies, depending upon the subject matter taught and the length of his lesson. Generally speaking, however, one hour of preparation should be spent for each minute the lesson will be on the air. In other words, it should take approximately 20 hours to prepare a 20-minute television lesson. Needless to say, in many instances this much time is not available because some studio teachers teach three or more lessons per week. Fortunately, this sort of production schedule is rapidly disappearing with the realization that quality TV lessons cannot be developed without adequate time for preparation.

Generally speaking, the evaluation of a television lesson should be guided by two considerations: Was it well received by the students? Did it help the teacher create a more meaningful learning situation?

The evaluator should make every effort to make his criticism constructive. General compliments are

pleasing to the studio teacher, but more helpful are comments concerning specific techniques and devices in the telelesson which were found to be effective. Conversely, unfavorable criticism needs to be equally specific. Regardless of whether the criticism is favorable or unfavorable, the classroom teacher is urged to take time to write out his evaluation, not just to mark items on a checklist.

Some criteria which the teacher may choose to use in evaluating telecasts include:

1. Did the lesson stimulate and hold attention?
2. Was the subject matter at the proper level?
3. Was the central purpose of the lesson clear?
4. Was the vocabulary used at an effective level?
5. Was the pacing of the lesson satisfactory?
6. Were directions and explanations clear?
7. Was the content accurate and well-developed?
8. Did the lesson motivate students to further learning activity?
9. Did the lesson introduce materials, information, or personnel not available to the classroom teacher?
10. Were the visuals adequate?
11. Was a summary given? If so, was it effective?
12. Were the advantages of the medium used effectively and fully?
13. Was the picture clear?
14. Was the sound distinct?
15. Comments: _____

_____

_____

_____

The studio teacher and other members of the TV production team are very much interested in the classroom teacher's reaction to their work. Observations, comments, and criticisms will be given serious consideration in planning future programs. The classroom teacher should make every effort to convey his evaluations to the source of the telecast. ■

V.

Note-taking

The ability to take notes is a valuable asset to learning which all students should begin to develop in the upper elementary grades. Note-taking is especially significant for students receiving part of their instruction from television because it helps them to record important information which is presented only once.

The teacher should make sure that all students understand the purposes of note-taking. Some of the purposes are:

- . . . To develop a record of important ideas and information presented in daily lessons.
- . . . To use for review in preparing for tests.
- . . . To retain daily and special assignments.
- . . . To summarize.
- . . . To develop vocabulary.

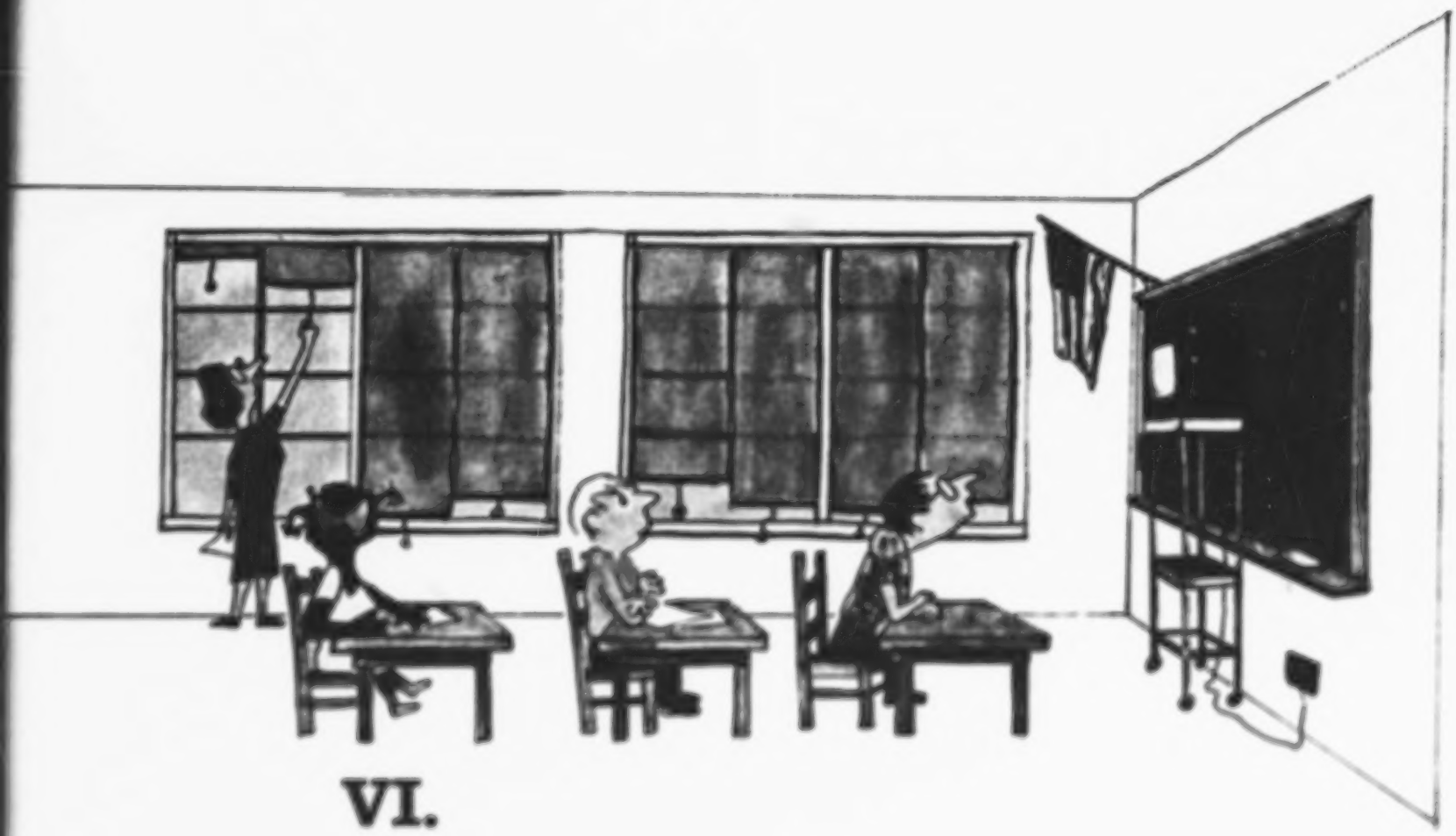
In the beginning all students will need guidance and close supervision by the teacher if they are to develop the techniques of note-taking. This is especially true of the young note-taker.

The teacher can help to orient students to the techniques of note-taking by:

- . . . Writing examples on the chalkboard or by using *an overhead projector.*
- . . . Developing outlines of the telecast and by leaving blanks for the students to fill in related material. This is a temporary measure; if used too frequently it might cause the students to become overly dependent.
- . . . Stressing the importance of learning to evaluate information and to record only important ideas.

Many students have a tendency to write down everything and become so engrossed in their work that they lose touch with the visual part of the telecast. Every effort should be made to discourage this practice.

To help students develop the ability to sift information, one approach might be to have them *not* take notes during the telecast but try to recall and write down the important ideas after it is completed. ■



VI.

Seeing, Hearing, and Learning

The ability to see, to hear, and to react is a basic need for learning. It follows that the physical facilities in the school have a great deal to do with whether a teacher can even begin to reach the students on the most basic levels of communication. Can the student see and hear what is going on? Are lighting, acoustics, ventilation, furnishings, proper for the task? Are room colors so depressingly drab that the atmosphere discourages enthusiasm? Facilities can make or break the effectiveness of both the teacher and the learning program.

All of these physical and environmental factors are common problems whether the "teaching image" is in the person of a teacher in the room or is coming to the student via television, tapes, projection or language laboratory equipment.

A. MAXIMUM VIEWING DISTANCE

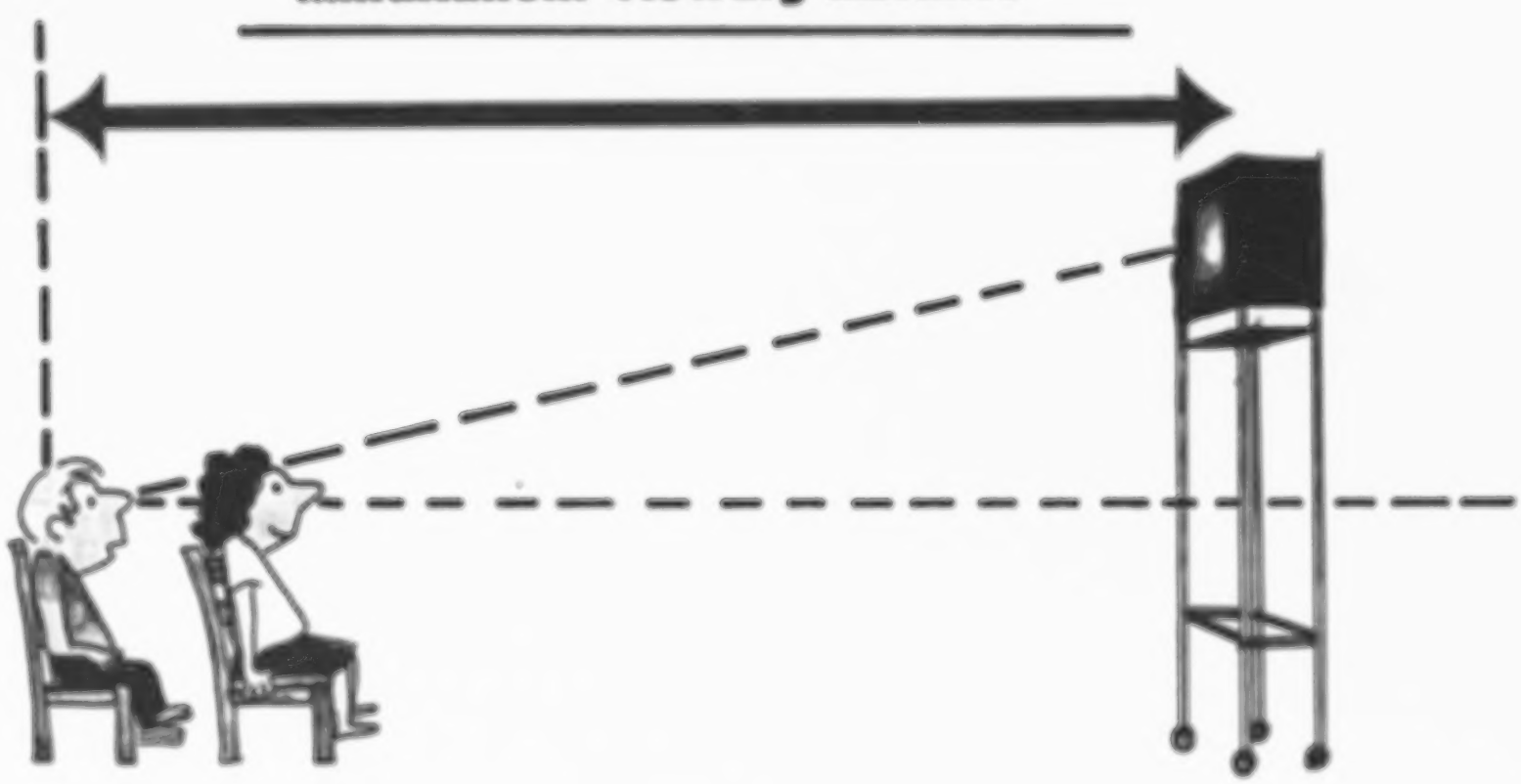
The studies which appear on this and following pages are based on in-line seating arrangements (one student or viewer directly behind the other) because this is the most critical condition in terms of group viewing, i. e., one student must see over the top of the head of the student in front of him. Staggered seating will allow lower placement of the image than indicated in these charts.

Quality of the televised or projected image is based on optimum quality practical with existing and available equipment, assuming that this equipment is kept in proper condition by correct adjustment for use and periodic maintenance checks.

Size of the televised image (screen size) establishes . . .

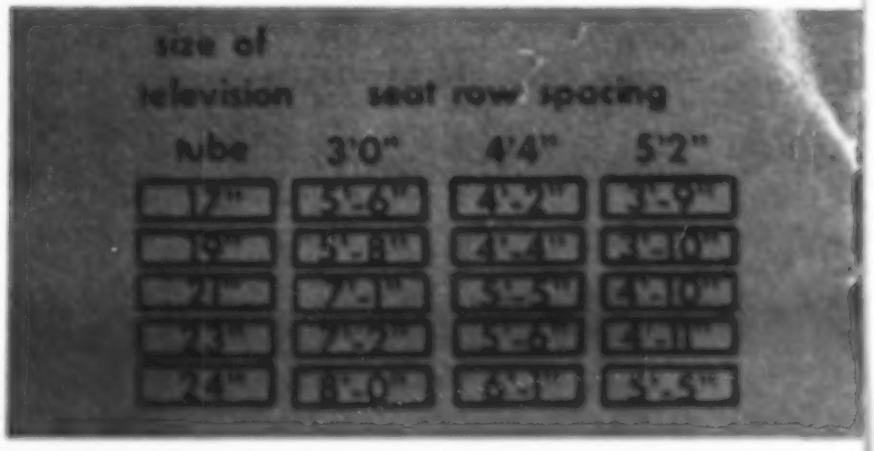
size of television tube	maximum viewing distance
17"	14'-9"
19"	15'-2"
21"	19'-0"
23"	19'-4"
24"	21'-5"

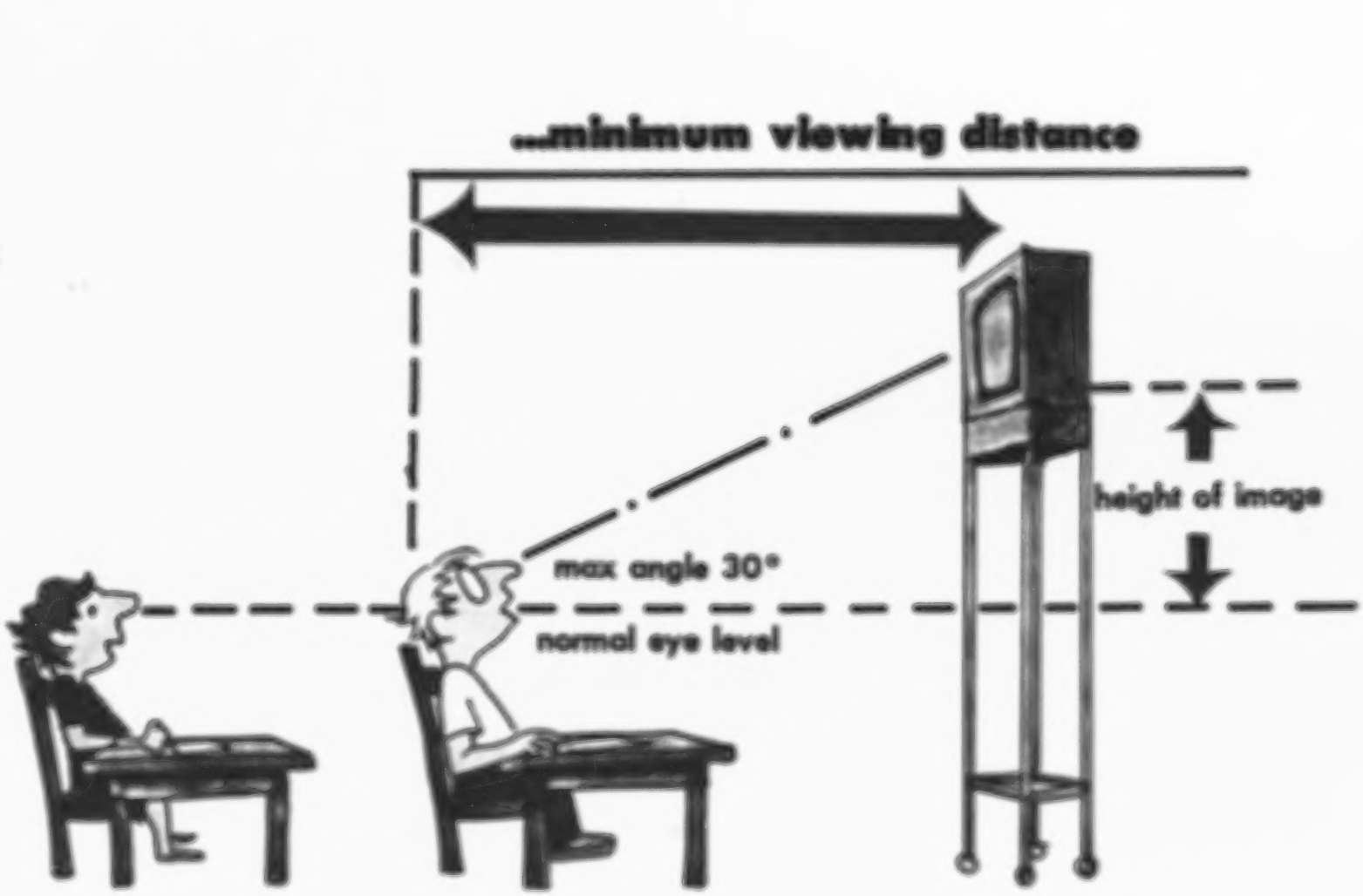
. . . maximum viewing distance*

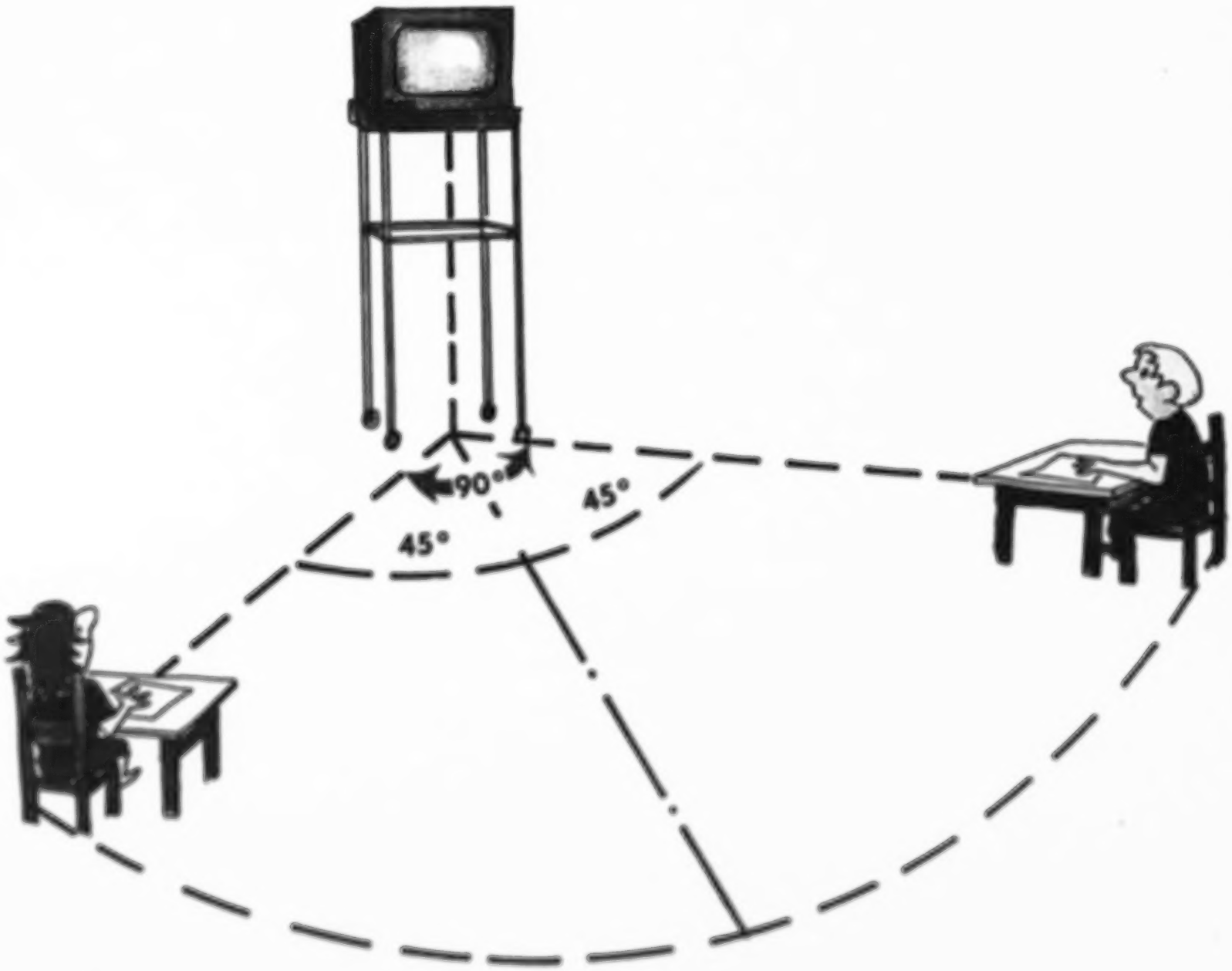


B. MINIMUM VIEWING DISTANCE

Once the maximum viewing distance has been established, size of the image, unobstructed sight lines from the back to front, and the height of the image placed at the maximum vertical angle for student viewing comfort (30°) must all be considered to establish . . .





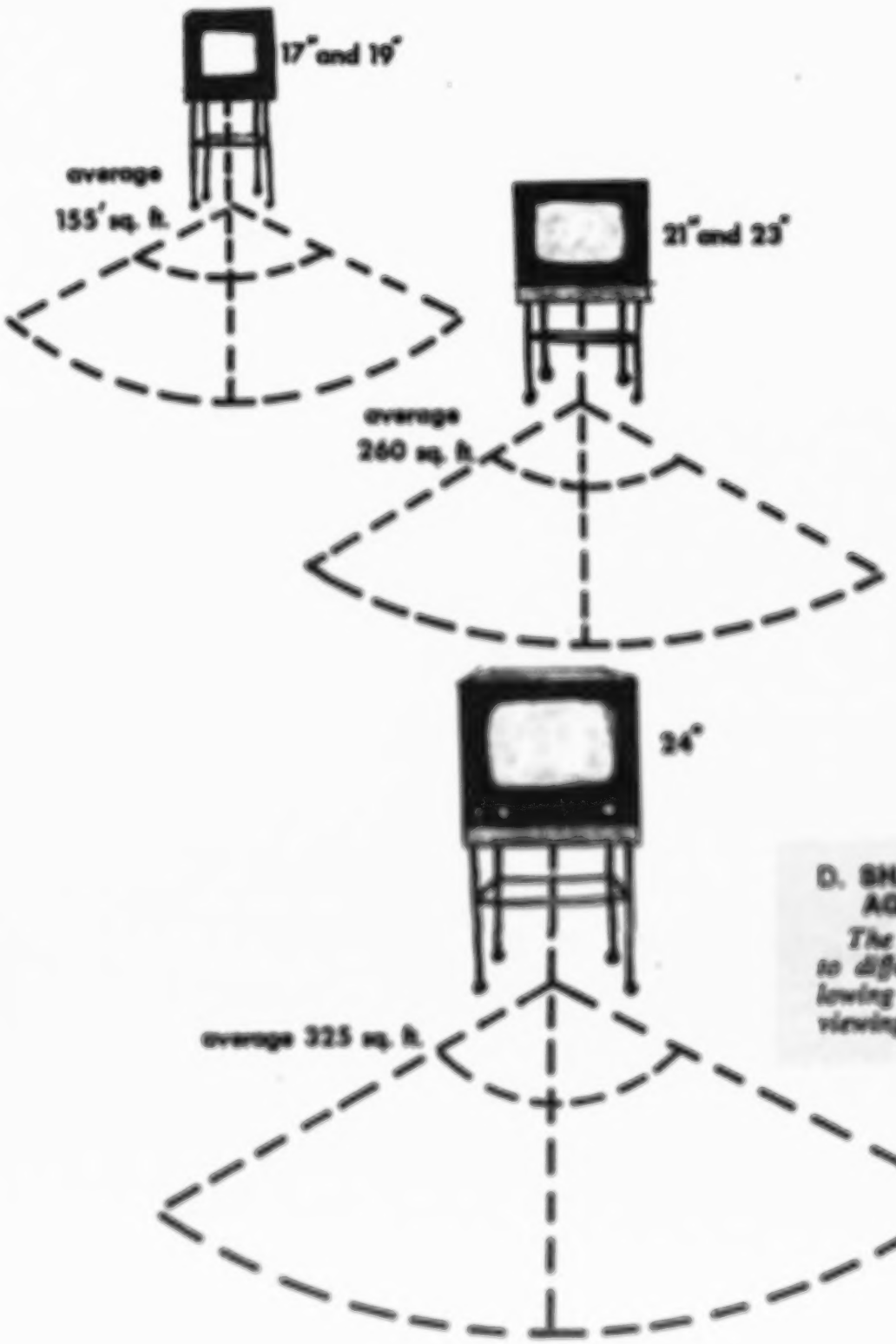


C. THE HORIZONTAL VIEWING ANGLE

Image distortion and legibility must both be considered to determine the horizontal viewing angle.

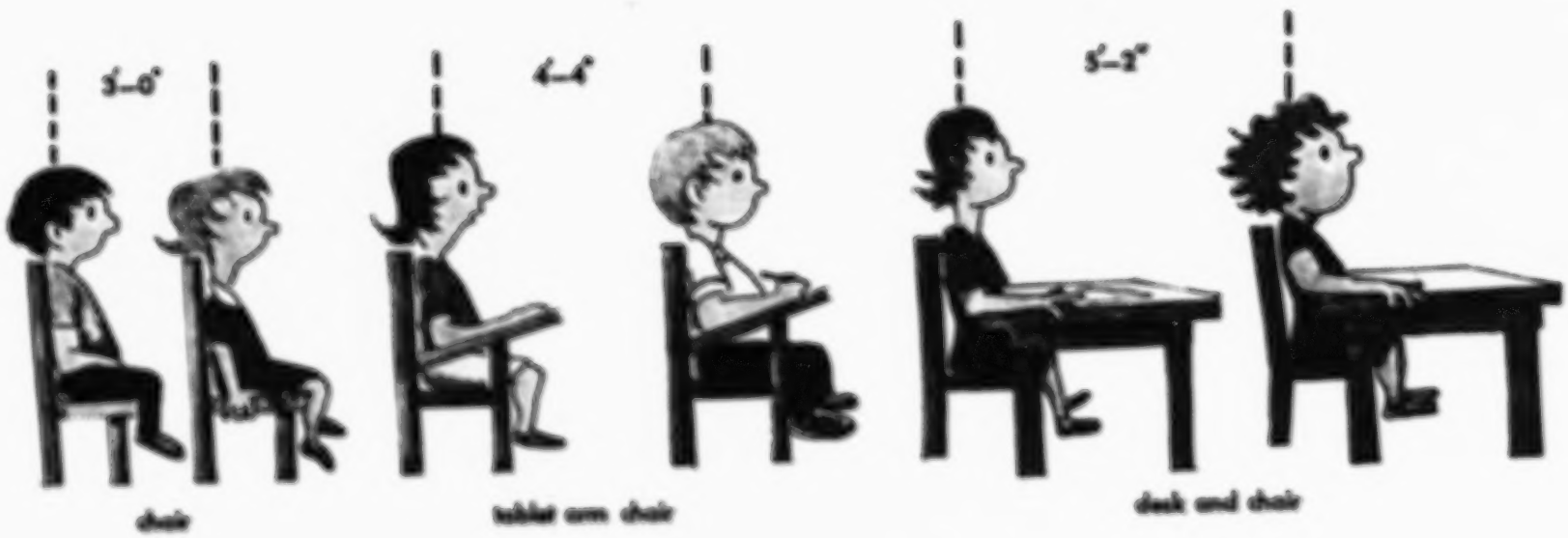
The high brightness characteristic of the television image, the theoretical 525 line resolution, and the characteristic curvature of the picture tube all affect the degree of legibility and/or distortion of the television image.

The further the viewer is seated from the center line axis perpendicular to the picture tube, the greater the image distortion with resultant loss of legibility. **A LINE OF VISION NOT MORE THAN 45° FROM THE AXIS IS THE MAXIMUM ANGLE RECOMMENDED FOR VIEWING MOST MATERIAL WITHOUT OBJECTIONABLE DISTORTION.** Where great emphasis is placed on televised images of a highly critical linear nature (where even minimal distortion would be considered objectionable), this line of vision should be reduced to 40° or even 30° with a resultant reduction in the potential audience group size.



D. SHAPE AND SQUARE FOOTAGE OF VIEWING AREA

The preceding facts when applied to different size images give the following shape and square footage of viewing area:



E. THE NUMBER OF VIEWERS THE VARIOUS AREAS WILL ACCOMMODATE

Several factors affect the number of viewers the various viewing areas will accommodate

1. Type of furniture and spacing
2. Teacher and pupil ingress and egress
3. Educational requirements
4. Building and fire codes

size of television tube	chair 3'0" spacing	tablet arm-chair 4'4" spacing	desk and chair 5'2" spacing
17"	32-34	20-23	16-18
19"	36-38	20-26	20-21
21"	52-54	31-36	24-29
23"	54-56	36-38	24-29
24"	64-72	41-52	33-34

The information on Seeing, Hearing, and Learning was taken from "Design for ETV" by permission of Educational Facilities Laboratories, New York. ■

VII.
Adjusting a Television Receiver

After the set has been turned on and an image appears on the screen, all that remains is to obtain the best possible picture for your students to view. This procedure begins with the selection of the channel you wish to view.

VHF TUNING (CHANNELS 2-13)

For channels 2 to 13, simply rotate the channel selector control to the desired channel. On some receivers the indexing of the channel selector can be difficult to read, and an image may appear on adjacent channels, especially in areas close to the transmitting station. Be sure you have selected the proper channel.

UHF TUNING (CHANNELS 14-83)

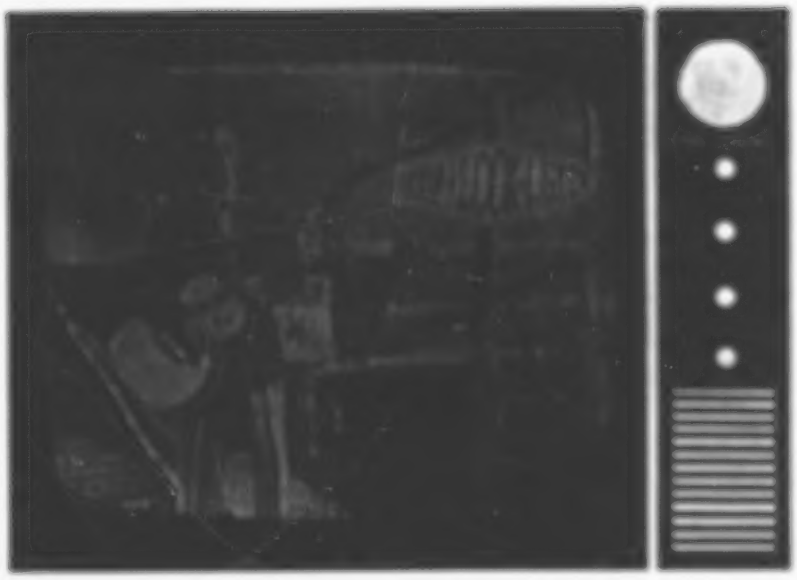
For UHF reception (channels 14-83) rotate selector control to the UHF position. Select your UHF station by rotating the UHF selector control slowly through the area adjacent to the channel number you wish to receive—much the same way you would tune a radio. After passing through the position of the control in which the picture appears, turn the control back slightly to a point where the sharpest picture and sound is received.

Your school may have a central antenna and television distribution system which converts a UHF signal to one of the VHF channels 2-13 which is not being used in your area.

This central distribution system may also offer programs from a video-tape recorder in your school, which makes educational television available at times more convenient for your use in the classroom. These programs may also be received on one of the unused channels between 2 and 13.

Properly adjusting a television receiver involves more than just obtaining a picture on the screen. Some of the more common conditions which are noticed on classroom television receivers are:

- Too much or too little contrast
- Too much or too little brightness
- Lack of horizontal hold adjustment
- Antenna or set placement problems
- Poor adjustment of fine tuning



FINE TUNING ADJUSTMENT

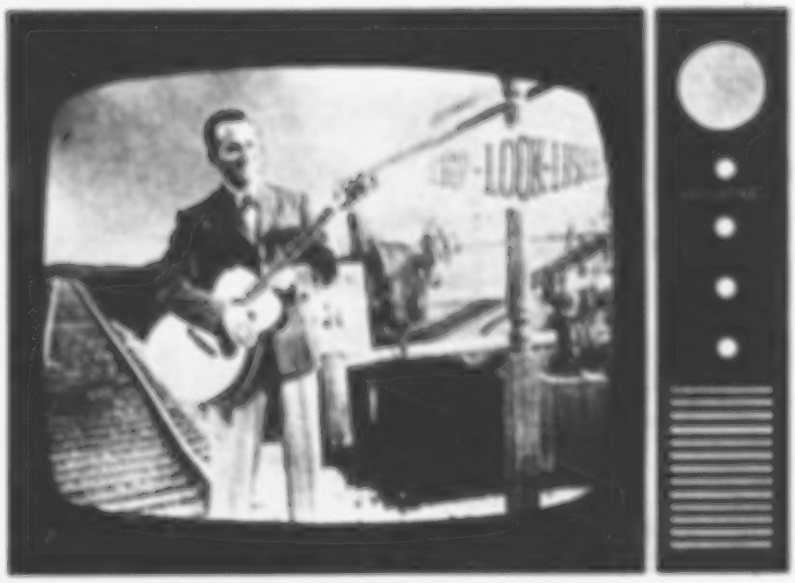
After the initial tuning has been accomplished, your receiver may show this kind of picture. You will note that the picture lacks sharpness and shows little detail, and has excessive ghost or halo images. Often, you will notice horizontal bars that will vary with the sound.

This condition usually can be corrected by proper adjustment of the fine tuning control on the television receiver.

Usually the amount of fine tuning needed is very slight. It is always a good procedure to rotate the fine tuning control first in one direction and then the other through the complete range in which a picture appears on the screen.

Next adjust the fine tuning control slowly until the picture shows the best sharpness.

Look particularly for details such as lettering. Best picture quality occurs when the fine tuning is adjusted slowly until the sound bars begin to appear. Then turn the control back just slightly to eliminate the bars.



BRIGHTNESS CONTROL ADJUSTMENT

Often the picture will appear washed out, lacking any highlights. Or it will be dense with details lacking on the darker portions of the screen.

The brightness control is used to adjust the total amount of light coming from the picture on the television set.

Adjust the brightness control until detail in the darkest parts of the picture is clear.

In general, the brightness control should be run at the lowest setting possible (that is, counter-clockwise) consistent with getting a good picture.

You may have to adjust the brightness control to suit the lighting conditions of your room.

CONTRAST CONTROL ADJUSTMENT

Often the picture will appear grayed-out or excessively harsh.

The contrast control provides adjustment of the ratio of black areas to white.

Adjust the contrast control until the picture reaches a pleasing balance between grayed-out and excessively harsh picture.

Again, both the brightness and the contrast controls should be operated at the lowest (most counterclockwise) setting which is consistent with a good picture.

VERTICAL HOLD ADJUSTMENT

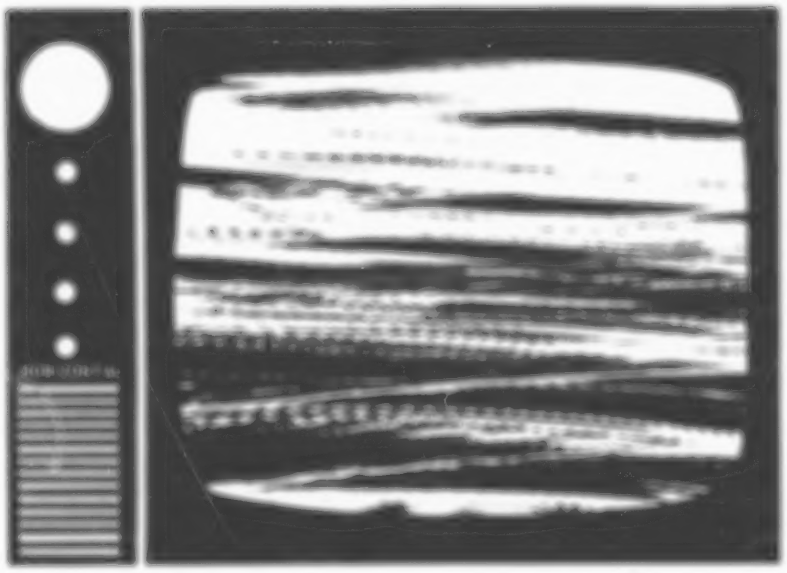
A condition which is quite easily recognized is a rolling or flipping of the picture.

The control which can correct this situation is the vertical hold.

Turn the vertical hold control until the picture is moving very slowly in a downward direction. Next turn the control slowly in the opposite direction so that the picture moves slowly upward and locks in.

This is the most stable position for the vertical hold control.

Often a manufacturer will place the vertical and horizontal hold controls on the back of the set.



HORIZONTAL HOLD ADJUSTMENT

If the picture is tearing horizontally or is distorted by strong diagonal lines or distorts in a sideways motion, your trouble may be a loss of horizontal hold control.

Correct setting for the horizontal hold control is found by turning the control counterclockwise until the picture distorts.

Note the position of the control. Next turn the control clockwise through a locked picture position until the picture distorts once more. Again, note the position of the control. Set the control at a point half way between these two points. This is the most stable position for the horizontal hold control.

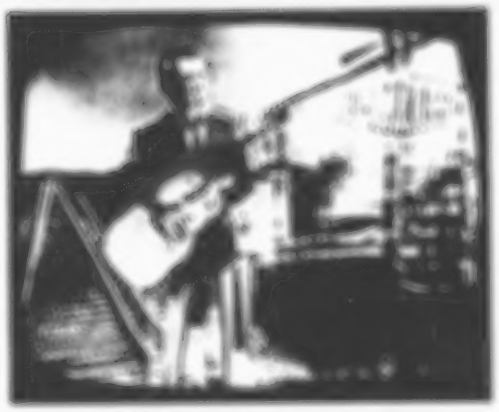
Ordinarily, vertical and horizontal hold controls will not need frequent adjustments. In some instances, proper adjustment of fine tuning will eliminate a vertical roll or horizontal breakup.

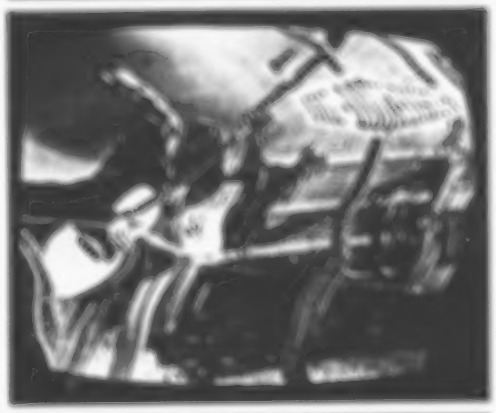
FINAL CHECK

The sound volume should not be excessive, but should be high enough to be heard without difficulty throughout the room.

Before viewing the program with your class, check the quality of the picture on your set from all points in your classroom where your students will be seated.

Check also for distracting reflections and extraneous materials around and behind the receiver which might detract from the image on the set.





You should be aware of other conditions which cannot be corrected with the basic controls.

GHOSTS

Multiple images (ghosts) are produced by reflected signals following more than one path to the receiver antenna. These may be caused by tall buildings, hills, etc. Orientation of the receiving antenna or a more directive antenna may be required.

SNOW

In some locations not normally considered distant from the television station, the signal may be of low strength causing a weak or washed-out image. Extreme conditions will cause the picture to appear spotted or granular. This condition, often referred to as snow, may be corrected by relocating the receiver, adjusting the antenna, or in some cases using an external antenna. Some locations may require antennas of special design.

INTERFERENCE

The interference pattern shown in the picture is the result of automobile or engine ignition systems. In some cases, this interference can cause rolling or tearing of the picture. A properly chosen antenna system can often eliminate much of this annoying condition.

TOO MUCH SIGNAL

In some locations, the receiver may be getting too much signal from the television station. As a result, the picture may appear distorted and fine tuning or horizontal hold adjustments will not correct this condition. The selection of a proper antenna system will eliminate this problem. Also try disconnecting the antenna from the receiver.

CO-CHANNEL INTERFERENCE

In some locations in the reception area, interference from another station on the same channel or on an adjacent channel will cause this type of interference pattern. This situation, more noticeable in the early spring and fall, can be corrected by a more selective and directive antenna system.

The material on "Adjusting A Television Receiver" was prepared by C. Edward Cavert for "Project ASERT," Lincoln Public Schools, Lincoln, Nebraska. (Photographs by W. Boyd Rooney.) ■

VIII.

Suggestions for Administrators

A. ORIENTATION OF TEACHERS

The importance of teacher orientation cannot be stressed too often. Full value can be obtained for an instructional television project only when the participating classroom teachers are aware of the purposes of participation and of the techniques which can be used effectively in making each telelesson an integral part of the curriculum.

It is suggested that administrators provide orientation workshops and seminars when the school system inaugurates television. Supervisors should provide continuing orientation for new teachers and for all teachers involved in a new series. Every effort should be made to utilize the consultant services offered by the educational television stations and by the State Department of Education. Every system which participates in instructional television should designate a person with responsibility for helping teachers in its effective utilization.

B. INSTALLATION AND RECEPTION

Administrators are urged to seek qualified engineering assistance in all areas relating to installation and reception. Such assistance should come from engineers with a record of successful experience in in-school television installation. It is recommended that this assistance be sought at the blueprint stage of new school buildings.

Ideally each classroom should be equipped with its own television receiver. If this is financially impractical, it is strongly recommended that every classroom be wired for reception.

C. UTILIZATION

The successful utilization of ITV by classroom teachers is heavily dependent upon the attitude of the administrator. Therefore, it is essential that principals and supervisors demonstrate support and enthusiasm for the television service.

Some administrative provisions for the effective use of instructional television:

- . . . Provide an adequate number of television receivers and antenna outlets.
- . . . Maintain a prompt, efficient TV repair service.
- . . . Give teachers released time for viewing in-service programs.
- . . . Offer assistance and guidance to teachers in the selection of programs.
- . . . Distribute curriculum guides and related materials promptly.
- . . . Encourage teachers to evaluate telecasts and to send their evaluation to the source of the programs.

D. SUGGESTED SPECIFICATIONS FOR TELEVISION RECEIVERS

. . . All-channel receiver with a minimum screen size of 23 inches.

. . . Educational model with special features such as anti-tampering devices.

. . . Safety glass must be glare resistant, shatter-proof, and be removable from the front for easy cleaning; in lieu of safety glass, bonded type faceplate picture tubes may be used.

. . . Speaker must be mounted on the front of the set parallel with the viewing surface of the picture tube.

. . . Sensitivity shall be minimum 10 UV nominal.

. . . Audio distortion is not to exceed 10% at 1.8 watts. Minimum peak power 5 watts.

. . . 72 ohm RG 59—foam cable is to be used from the tuner to suitable coaxial fittings on the rear cover of the set.

. . . One (1) 72 ohm RG 59—foam cable 20 ft. in length is to be supplied with suitable fittings on both ends.

. . . Each set is to be equipped with three (3) conductor, 20 ft. power cord, "SJ" type and grounded electric plugs for connecting receiver to 110 volt AC power source.

. . . Each set shall be supplied with ground plug adapter for operating receiver on non-grounded type electric receptacles.

. . . Input power requirements are 105-130 volt AC 60 cycles.

. . . Each receiver shall be manufactured in the USA and of USA materials.

. . . Each receiver shall be equipped with transformer power supply and must be of the isolation type, i. e., secondary must be electrically insulated from the primary. External isolation transformers are not permitted.

. . . If circuitry is of "Printed Board" type, it must be of heavy duty durable construction, mounted free of vibration and high heat; it must be warp proof.

. . . Transistor circuits are desirable. If provided they must be mounted in sockets and easily accessible for replacement. They shall not be soldered at the point of connection.

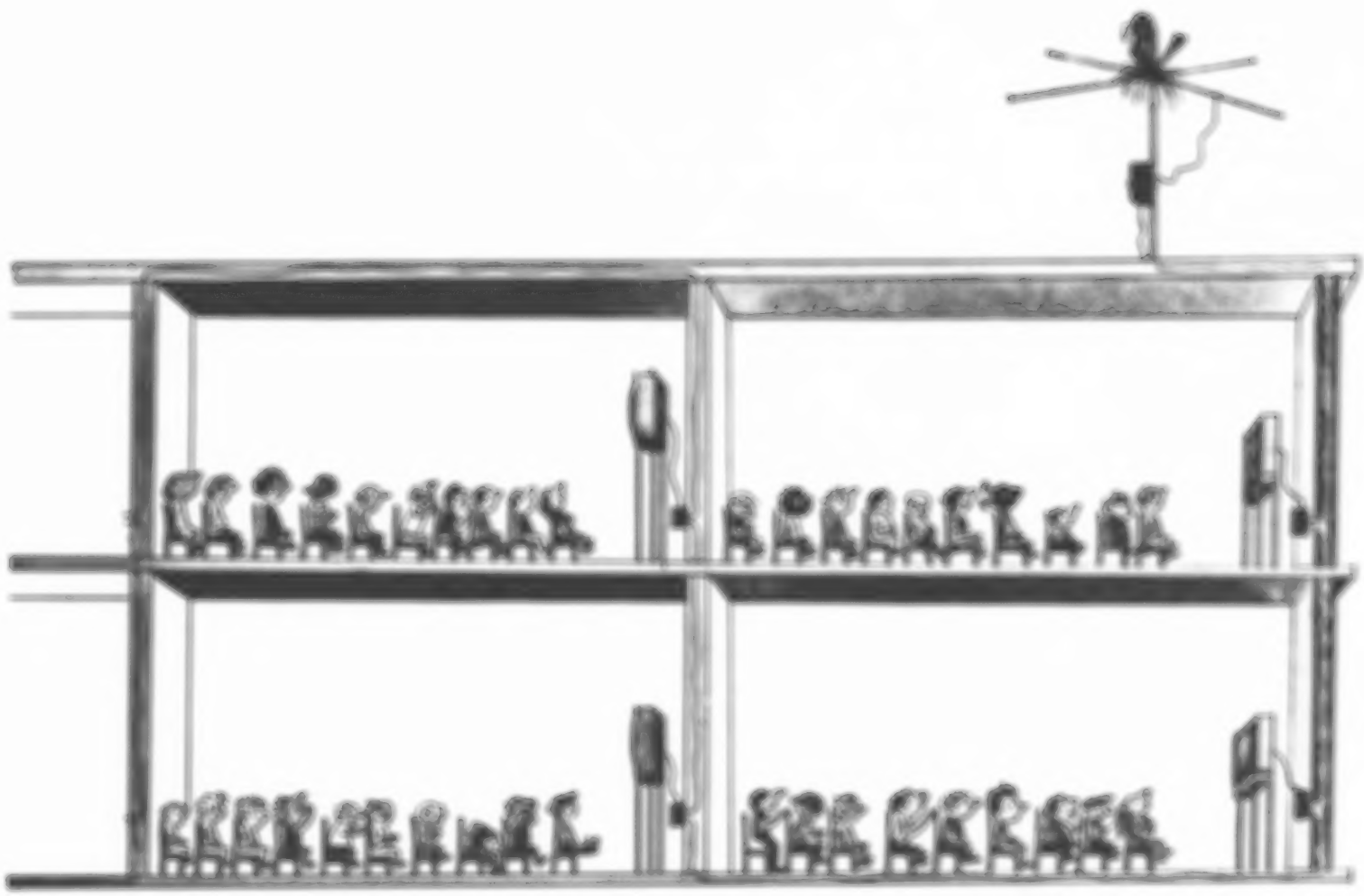
. . . Silicon rectifiers for DC power may be used in lieu of power tube.

. . . Color and finishes of receivers will be selected from manufacturers' standard colors and finishes.

. . . Rolling stands with industrial wheels at least 4 inches in diameter should be provided for all unmounted sets. Stands should have a minimum height of 48 inches and be equipped with some type of tie-down or anchoring device for sets. (Locking wheels are not recommended because their use has been known to result in the accidental tipping over of TV receivers.)

. . . The design and construction of the receiver should provide maximum safety, simplicity, convenience of operation, and maintenance.

Compiled by Robert C. Medley, Norfolk City School Board, 1967



E. SUGGESTED SPECIFICATIONS FOR AN INSTRUCTIONAL TELEVISION RECEPTION AND DISTRIBUTION SYSTEM

GENERAL

. . . The work to be provided under these specifications consists of furnishing and installing a complete and operable RF reception and distribution system.

. . . The contractor should show evidence of having successfully completed at least three other similar projects, or that this project will be constructed under the direct supervision of an engineer representing the manufacturer of the principal equipment involved.

. . . The contractor should provide certification of adequate workmen's compensation, personal injury, and property damage insurance coverage before commencing work.

. . . The contractor shall show evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system, including replacement parts. The contractor shall be prepared to offer a service contract for the maintenance of the system after the guarantee period.

. . . The contractor shall provide a set of operating instructions which include circuit diagrams and other information necessary for proper operation and maintenance as well as submission of the proposed system layout which meets all items of the specifications. In addition, the contractor shall submit manufacturers' specification sheets covering all component parts of the system.

. . . All electronic equipment shall carry the label of Underwriters Laboratories, Inc., and when ap-

plicable shall be a product of a single manufacturer of established reputation and experience who shall have produced similar apparatus for at least three years, and who shall be able to refer to similar installations rendering satisfactory service.

. . . All equipment, including the wiring, cabling, and junction boxes, furnished and installed, shall be guaranteed for a period of one (1) year from the date of final acceptance thereof against electrical or mechanical defects or failures.

. . . The contractor shall furnish all necessary equipment, labor, and installation materials, whether specified or not, to provide a complete system.

. . . The installation should be made in accordance with the latest requirements of the National Electric Code and ordinances, and regulations of any governing body having jurisdiction.

SYSTEM PERFORMANCE

. . . The system shall comply with the radiation limitations as set forth under Part 15, as amended, of the FCC Rules.

. . . All equipment shall be designed and rated for 110 volt 60 cps AC operation and shall be UL-rated for 24 hours a day continuous operation.

. . . The system shall have a signal to noise ratio of 40 db or greater.

. . . The overall system frequency response shall be flat to +1½ db across the 6 megacycle bandwidth of any television channel.

. . . The overall system shall have a voltage standing wave ratio of 1.2 or less to prevent ghosting.

. . . The design and installation of the system shall be such that extensions, additions, or modifications will be possible without altering the system requirement of a voltage standing wave ratio of 1.2 or less.

. . . The signal at any output shall not be less than 1,000 microvolts nor more than 10,000 microvolts into 75 ohms. The signal at each outlet shall equal in quality the signal available at the antenna output and shall be within 15 db of same signal at any other outlet on the system.

. . . Extraneous signal pickup shall be at least 50 db down from the desired normal minimum signal level.

. . . The system shall be designed to accept modulated signals from closed-circuit televising equipment without making obsolete any of the equipment installed.

. . . The system when installed shall be capable of passing standard color TV signals without the introduction of noticeable effects on color fidelity and intelligence.

EQUIPMENT SPECIFICATIONS

. . . *ANTENNA*—The antenna shall have such electrical characteristics as to produce with the system supplied the required level of the signal which shall be ghost-free. The supplier shall specify the manufacturer, the type, the electrical characteristics, and the mechanical arrangement with the bid.

a. The antenna shall be capable of withstanding 80 mph winds under ½ inch ice loading or 75 mph without ice. All mounting hardware and terminals shall be securely fastened.

b. The antenna shall be guaranteed as to physical condition for a period of at least one year.

c. Both UHF and VHF antennas may be mounted on the same mast. To avoid interaction between the two antennas, a distance of at least 42" must be allowed between the reflector element of the VHF and the lowest element of the UHF.

. . . *TOWER*—Antenna mounting shall be accomplished with the use of galvanized steel mast or tower of sufficient height to ensure consistent good reception of the UHF signals. The mounting base for this mast or tower shall be of such design as to securely hold the mast as well as to protect the roof from damage. At least three (3) guy wires shall be used for every ten (10) feet of mast height. All mounting components shall be of a rust-proof metal to ensure protection against the elements.

a. In all cases where a "bonded" roof must be punctured to facilitate installation of an

antenna have plate a "pitch pocket" must be provided for the purpose of maintaining the watertight integrity of the roof.

b. Electrical grounding of the tower shall be done by wire of AWG #6 or larger in compliance with applicable codes and ordinances.

c. When towers are to be fastened to building or other structures, the bidder shall supply complete drawings of the proposed installation.

...*PREAMPLIFIERS*—Preamplifiers shall be supplied as required to produce the specified required signal levels. Preamplifiers shall be mounted in weatherproof housings adjacent to the antenna terminals. Power may be provided to the preamplifiers by the signal cable.

The preamplifier noise figure shall not exceed 7 db at 213 megahertz or 9 db at 900 megahertz.

...*CONVERTERS*—The converter employed shall have the input impedance matched to the antenna or preamplifier output and shall have 75 ohms output impedance. The noise figure shall not exceed 10 db and the frequency change shall be less than 0.01 percent from 0 to 100 F. The frequency response shall be flat within ±1 db across the 6 megahertz bandwidth of the channel.

...*VHF DISTRIBUTION AMPLIFIER*—The amplifier shall have an output of at least 4 volt RMS on all channels for a single channel type and at least 0.5 volts RMS per channel for a distributed type amplifier.

a. Automatic gain control shall be used. The output voltage of the single-channel amplifier, if used, shall not vary more than 6 db.

b. The noise figure shall not exceed 10 db and the frequency response shall be flat within ±½ db over the channel bandwidth.

c. The input and output impedance shall be 75 ohms.

d. The amplifier shall have provision for adjusting the gain or output level.

e. Single channel amplifiers shall have an independent power supply.

...*LINE SPLITTERS*—A sufficient number of line splitters shall be supplied to provide enough through lines for the entire system. Splitters shall provide at least 12 db mid-band isolation between through lines.

...*TAPOFFS*—(receiver isolation network)—shall be supplied for each TV receiver or receiver location which may be used in the system. Tapoffs shall be the resistive type to ensure uniform loss vs. frequency characteristics. They shall use blocking capacitors to prevent AC hum. TV receivers shall be isolated from through lines by at least 12 db. If the tapoff does not contain a 75 ohm to 300 matching device, such a device shall be installed at each TV receiver. Through line loss of tapoffs shall not exceed 0.7 db per TV.

...*DISTRIBUTION CABLE*—shall be RG-59 or 11/a foam type coaxial. Quality of this cable shall allow the following minimum attenuations. At Channel 2—1.8 db per 100 feet, at Channel 13—4.0 db per 100 feet.

All cable that is to be exposed directly to the weather or to sunlight, whether coaxial or "twin-lead" type, should be polyethylene sheathed with black "anti-ultraviolet" pigmentation.

INSTALLATION

...Down leads from the antennas to the preamplifiers shall be kept to a maximum of 36" in length and only foam type 300 ohm or coaxial cable should be used. This is a critical point and no other method will be acceptable.

...The down-leads or lead-ins from the preamplifiers to the point where they enter the building shall be securely held by standard TV type standoffs, at least 4" in length. This also applies to the VHF lead-in. Both may be run in a combination coaxial-standoff. Standoffs are not needed if the cable is run through the antenna mast.

...All cable that is installed exposed should be neatly dressed with galvanized metal cable clamps outside and with wraparound plastic cable clamps inside at no less than (4) four foot intervals.

...Cable with foamed-type insulation is acceptable for all except underground installation. Under-

ground cable should be in metal conduit or plastic water pipe of appropriate diameter and buried at sufficient depth to assure its freedom from injury as a consequence of routine grounds maintenance or gardening. Strong mechanical protection should be provided at points of emergence for entrance into buildings or to poles or towers.

. . . Cable that is installed in aerial spans should be supported by an appropriately sized, galvanized support wire and should be lashed to the support wire with stainless-steel lashing wire. Cables with built-in support wires are acceptable. Aerial spans that are to make use of utility poles should be installed only after the contractor has certified that he will meet applicable technical and insurance requirements.

. . . Cable brought into buildings from the exterior should be routed so as to assure that the normal functions of windows, doors and screens will be maintained and each point of entry should be carefully waterproofed. All outdoor connections and fittings for coaxial cables should be coated with Dow-Corning #5 silicone grease or equivalent. Care should be taken to see that cables avoid contact with hot-water or steam piping or with heaters or radiators and are kept well away from electrical wiring. The classroom outlet at which the cables terminate should be a "screw-on" or "plug-in" type, capable of repeated, long-term use permitting the TV sets to be easily disconnected for service or movement within the school.

. . . Each through line at the end shall be terminated with a 75 ohm resistor to insure proper impedance match.

. . . Contractor shall include in his quotation enough to provide one 20-foot jumper cable for each television set. These cables shall be made up with a suitable plug and set matching transformer.

. . . Electronic equipment accessible to the public shall be housed in a ventilated locked cabinet.

. . . All wiring, installation, and construction shall be done in a neat, workmanlike manner.

GENERAL EQUIPMENT REQUIREMENTS

. . . Performance of the system shall not be dependent upon tubes of a given type having other than average characteristics for the type.

. . . All equipment operating from a power source shall be adequately fused.

. . . Fuses of the equipment shall not be dependent on fuses of a given type, having other than average specifications for the type.

. . . Fuses shall be easily replaceable and mounted, where practicable, in a convenient location.

. . . Microphonic tendencies shall be kept to an acceptable minimum compatible with the performance requirements of the equipment as specified herein.

EQUIPMENT TESTS

. . . Upon completion of the system installation, it shall be the responsibility of the installer to perform the necessary amplifier level control adjustments, and the following system tests to show compliance with all system specifications.

. . . At such time as the owner may direct, the contractor shall conduct an operating test for approval. The equipment shall be demonstrated to operate in accordance with the requirements of these specifications. The test shall be performed in the presence of the owner or his authorized representative. The contractor shall furnish all instruments and personnel required for the test as follows.

. . . Test for Proper Amount of Signal at Tapoffs:

1. Using a field strength meter, measure the signal level at any tap on the system at random. Signal on each channel should read 1,000 UV (across 75 ohms), or greater.
2. Connect a TV set at an outlet on the system at random. Picture quality on all channels must be equal or superior to reception normally available in the area or no less than A Grade (2) two according to TASO standards.

Compiled by
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IX. Suggested Letter to Parents . . .

Dear Parent:

Your child _____ is being given the opportunity to participate in a televised course in _____ this year. The studio teacher, _____, and I have common interests in the subject, the students, and teaching, and we both have a common goal--inculcating in the students a knowledge and enthusiasm for the subject.

The television lessons will be beamed on our Educational Television Station _____ Channel _____.

You may wish to watch the television lesson at home or arrange, through the principal, a visit to the classroom to see the entire lesson, including the pre-telecast, and follow-up.

In addition to the in-school telecasts, our ETV station schedules programs of interest to adults and children in the evenings.

Our class is looking forward to this experience. The studio teacher and I will do everything we can to make your child's learning situation a good one. We shall welcome your interest and cooperation.

Sincerely yours,

X. Glossary of Television Terms . . .

Amplifier—an electrical device used to strengthen the audio and/or video signal.

Antenna—a conductor used for receiving or transmitting radio or television signals.

Aspect Ratio—this refers to the dimensions of visuals used in TV, i. e., relation of height (3 units of measurement) to width (4 units).

Audio—the sound portion of a television presentation.

Bicycle—to send taped programs between stations by various means of transport, i. e., bus, train, plane, etc.

Camera—the instrument which converts a visual image into electrical impulses.

Channel—the frequency assigned for a television transmitter or closed-circuit modulator.

Clearance—permission to use copyrighted material.

Closed-Circuit Television (CCTV)—a system whereby programs are transmitted only to receivers connected to the production center by coaxial cable or microwave.

Close-up—a tight shot used to make a larger than normal picture of the subject.

Coaxial Cable—specially constructed cable used to transmit high level video signals.

Community Antenna Television (CATV)—a master antenna and distribution system capable of receiving, amplifying, and distributing a broadcast signal via wire or cable to the TV receiver.

Contrast—the relation of black and white on a projection or TV receiver screen.

Definition—sharpness and clarity of image on screen.

Diorama—miniature set used for landscapes, towns, etc.

Direct television teaching—presentation of the major part of a course of study by the studio teacher.

Dissolve—fade out picture from one camera, and fade in picture from another camera.

Dolly—platform on wheels used to support camera.

Dolly in, dolly out—to move camera toward subject or away from it.

Dry run—studio rehearsal.

Educational television (ETV)—the use of television for classroom instruction as well as community and cultural programming.

Federal Communications Commission (FCC)—the federal agency responsible for making policy and exercising control over all use of the air waves for broadcast purposes.

Floor manager—assistant to the director, works in studio during program.

Foot candle—a unit of measurement applying to light intensity.

Instructional television (ITV)—programs produced and designed for classroom instruction on any educational level.

Instructional Television Fixed Service (ITFS)—A system providing up to four channels for relatively short-range transmission over-the-air of instructional programs.

Kilocycle (kc)—a unit of frequency equal to 1,000 cycles.

Kinescope—the picture tube in the TV receiving set.

Kinescope recording—a film of a television program made directly from the face of the viewing tube.

Lens turret—a disk mounted on the front of the camera for holding various size lenses. It can be turned to bring different lenses into use.

Master antenna system—one antenna with a distribution system designed to eliminate the need for an individual antenna for each receiver.

Megahertz (Megacycle)—1,000,000 cycles per second—this refers to the frequency of electromagnetic waves such as those used to broadcast radio and television signals.

Microwave—a special high-frequency transmitter used for carrying audio and video signals in a point-to-point direction. A single link, consisting of transmitter and receiver, can cover distances up to 50 miles.

Monitor—an off-the-line receiver used in studio and control room for showing picture of the program in progress.

National Association of Educational Broadcasters (NAEB)—an organization representing people involved in the production, distribution, and use of educational and instructional television programs.

National Educational Television (NET)—producer and distributor of educational television programs on a nationwide basis.

Network—a group of interconnected television or radio stations capable of simultaneous broadcast of a single program.

Open Circuit television (Broadcast)—radio wave transmission directly from the television station intended for reception by the general public.

Pan—the slow movement of the camera to either the right or left.

Practical scenery—scenery that works, such as a door that can be opened or closed.

Prop—furniture or objects used in a set.

Script—written copy of the audio and video portions of a television production including directions for the presentation of the program.

Service area—the region in which a broadcasting station's signal can be received with satisfactory results.

Studio teacher—the teacher who presents lessons on television.

Superimpose—the process of exposing the picture from one camera on that of a second camera.

Talent—this refers to the studio teacher or any guests he may present before the camera.

Television as enrichment—the presentation on a scheduled basis of materials, resources, and experiences which are not part of the basic curriculum.

Transmitter—the electronic equipment used to generate and send radio signals.

Tilt—swing camera up or down.

Total teaching by television—all teaching associated with a particular course of instruction is done by the studio teacher.

Translator—an electronic device used to extend the service from a broadcast TV station. The translator accomplishes this by receiving, amplifying, and retransmitting the signal.

Ultra high frequency (UHF)—a frequency of 300 to 3,000 megacycles per second. It is used on channels 14 through 83.

Very high frequency (VHF)—a frequency of 30 to 300 megacycles per second. It is used on channels 2 through 13.

Video—the visual portion of a television presentation.

Video-tape recorder (VTR)—a device which uses special magnetic tape to record both the audio and video portions of a television production for replay at a later date.

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